Engineering Library

WARM AIR FURNACE SPECIAL

AMERICAN ARTISAN and Hardware Record

VOL. 84. No. 27. 620 SOUTH MICHIGAN AVENUE, CHICAGO, DECEMBER 30, 1922. $2.00 Per Year

Flaws in the Diamond

YOU know how flaws affect the value of a diamond. But do you know how flaws affect the value of iron and steel? Little spots of impurities make up the flaws in iron and steel.

You can't see these little spots, even with the glass that detects the flaws in a diamond.

Nevertheless, these same spots lead to the complete decay of the metal. When it is exposed to the weather, rust eats its way into the sheet.

That's why it is important for you to use a *rust-resisting* iron.

"Armco" Ingot Iron is rust-resisting. It is commercially pure iron. The "texture" is smooth and even. When galvanized, the zinc coating and the base metal are properly alloyed, with no tendency of the coating to crack, split, and peel where the stresses come.

There is no guesswork about "Armco" Ingot Iron. Every sheet is made to the same standard, and all sheets are uniform. You know that whatever you can do with one sheet you can do with another.

You cannot afford to use inferior metals in your business. Your reputation depends on satisfied customers, and you can give satisfaction only when you use sheet iron that will stand up under hard service.

Use rust-resisting "Armco" Ingot Iron.

THE AMERICAN ROLLING MILL COMPANY, Middletown, Ohio

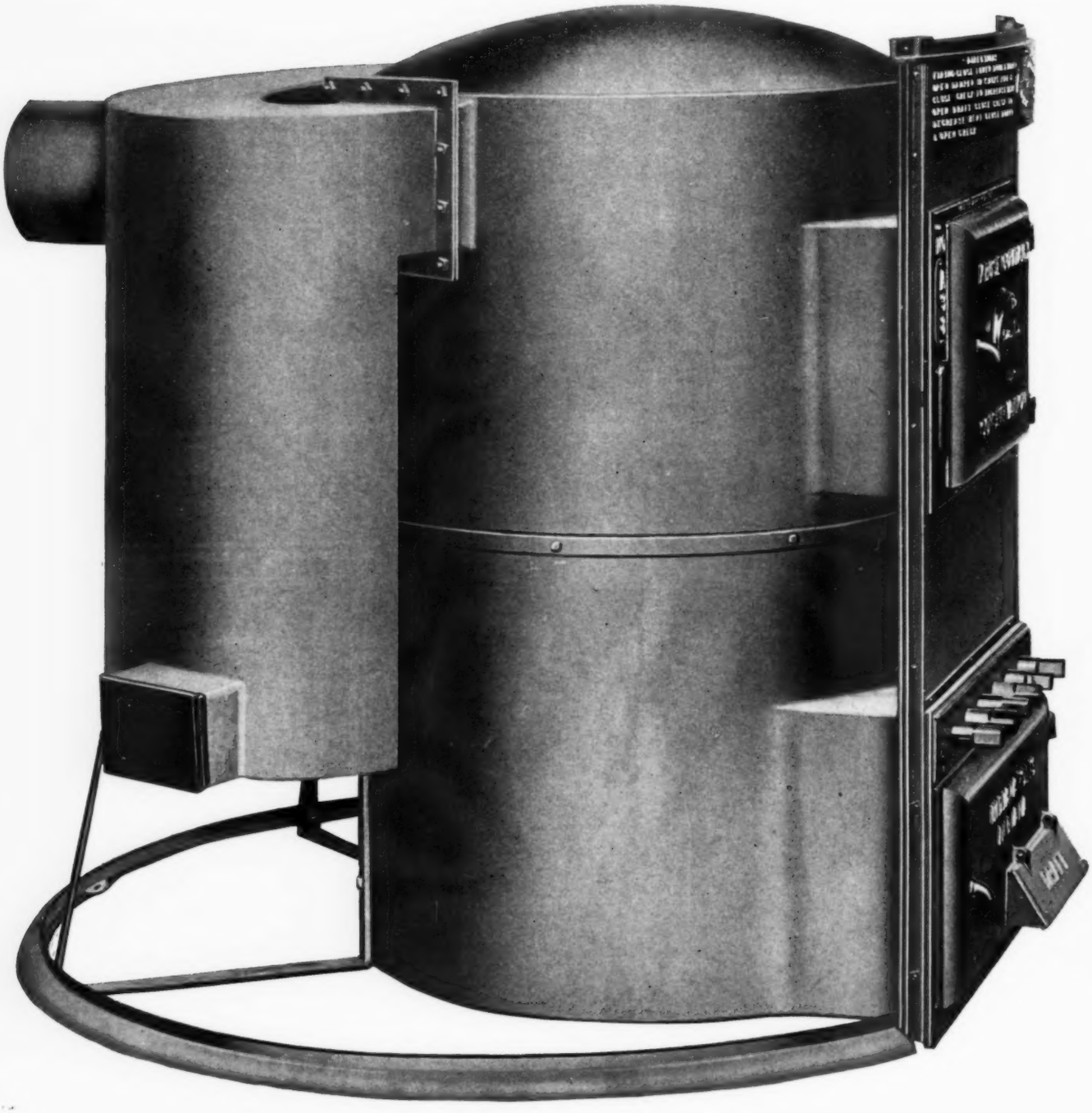
ARMCO

TRADE MARK

INGOT IRON

Resists Rust

"THE WELDED STEEL FURNACE"



MANUFACTURED BY

KRUSE CO. *INDIANAPOLIS, INDIANA*

Gee, There's a Lot of Heaters Made! How's a Fellow to Know Which Line Is the Most Profitable?

AH! here is some good advice in this Chapter on—"What Experience Has Taught Father Time."

In my time there have been many heaters manufactured. Some proved to be good heaters, others were unprofitable for the dealer, unsatisfactory to the owner, and furnished the manufacturer and dealer a poor foundation for future business.

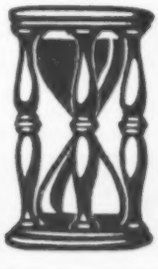
Poor Richard says—"Many have been ruined by buying great pennyworths." That is a quaint but very illustrative way of expressing the folly of attempting to build a permanent business on price appeal only.

Manufacturers of good heaters whose prestige dates back to the pioneer days of heating stoves, recognize the value of quality. Among the most prominent of these, and Nationally known, is the INTERNATIONAL HEATER COMPANY; makers of all standard types of heaters.

They are the oldest, largest exclusive manufacturers of heaters in this country and are known all over the U. S. A. as makers of quality products. Their name on a heater is your customer's assurance of quality and satisfaction, and satisfied customers are your best asset.

Therefore, I recommend that you start the New Year by placing the *"sign of good heating"* on the front of your store. Talk, sell and install INTERNATIONAL HEATERS. By so doing your business will be improved, your cash registers will be busy and you will make for yourself and your customers a Happy and Prosperous New Year.

INTERNATIONAL HEATER COMPANY UTICA, N.Y.



ALPHABETICAL INDEX AND CLASSIFIED LIST OF ADVERTISERS, Pages 136-138-140.

Published Weekly, Entered as Second-Class Matter June 25, 1885, at the Post Office at Chicago, Illinois, under Act of March 9, 1879.

THE UTICA HEATER COMPANY LINE

SUPERIOR PIPE FURNACE

With Patented Casing Connection, Direct Connected Cleanout, One-piece Cast Radiator, Frameless Feed Door, Large Air Moistener, Anti-Clinker Grates, Roomy Ashpit and Frameless Ashpit Door.

SUPERIOR
Pipe Furnaces

The new Type "A" SUPERIOR Furnaces can be erected in a remarkably short time. They have important exclusive mechanical features and are built in accordance with scientific research, conducted by the Utica Heater Company and the leading warm air experts of the United States.

* * *

Dealers selling SUPERIOR Furnaces handle a big volume of business as these improved furnaces take such little time to install. Their customers also are pleased with the clean, smokeless operation; which is assured by the frameless feed and ashpit doors, the direct-connected cleanout, seamless cast iron radiator and other mechanical improvements.

* * *

SUPERIOR Furnaces make good on every job, because they are properly designed. Criticism of warm air heating has resulted from poorly proportioned furnaces and incorrect installations. SUPERIOR Furnaces are technically right in every respect, guaranteed as to capacity and meet every requirement of practical, first-class heating men.

* * *

Write for complete information about the new Type "A" SUPERIOR Furnace and inquire regarding the SUPERIOR agency for your section. Also ask about the SUPER-SMOKELESS Furnace for burning soft coal smokelessly—now in successful use in practically every soft coal section.

Originated and Manufactured by the UTICA HEATER

E OF PIPE AND PIPELESS FURNACES

NEW IDEA Pipeless Furnace

Type "A" NEW IDEAS have become tremendously popular with furnace men all over the country. A few hours for complete erection, and a man is all set for another job. Dealers not already familiar with it should hook up with the fastest selling, easiest erected and most satisfactory pipeless heater made—the NEW IDEA Type "A" Pipeless Furnace.

* * *

Type "A" NEW IDEAS have pressed steel floor plates; triple galvanized casings; patented casing connections; seamless cast radiator; direct-connected cleanout; frameless feed door; large air moistener; heavy cupjointed firepots; large ashpit with anti-clinker grates and frameless ashpit door.

* * *

NEW IDEA Pipeless Furnaces are in use in thousands of homes and other buildings. Both users and dealers recommend them enthusiastically as thoroughly efficient in heating and economical on fuel. The success of this furnace is undoubtedly due to the mechanical perfection and scientific proportions of the castings and air passages embodied in all Type "A" heaters.

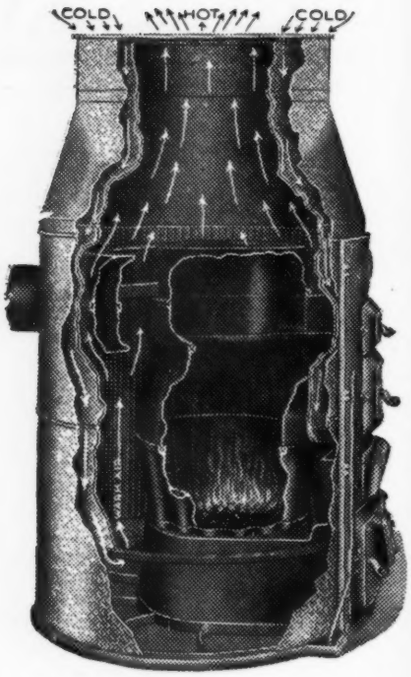
* * *

Progressive furnace dealers will consider the sales possibilities of the NEW IDEA Pipeless Furnace. Its popularity is based on a combination of dealer and home-owner appreciation of its splendid qualities—it is also made as a SUPER-SMOKELESS Pipeless Furnace.

NEW IDEA PIPELESS FURNACE

Triple Galvanized Casings, with patented "slip-on" connections, scientifically correct Type "A" inner castings with valuable and exclusive improvements to assure gastight, dustproof operation.

COMPANY, Utica, N. Y., 218-220 W. Kinzie St., Chicago, Ill.



The Wise Pipeless is, in its quality of materials, and also its workmanship, identical to the Wise Pipe furnace. Its pipeless construction is well designed and unusually efficient. For all purposes where a pipeless style of furnace is practical a Wise will more that satisfy.

Ask for our special circulars on the Wise Pipeless.

WI

WISE *is* a big name in the warm air heating field.

It is not strange to us why Wise dealers renew their agencies year after year.

The fact that many of our original dealers, who started in the Wise business with us nearly twenty years ago, are still with us is not strange to us either, although we are naturally highly pleased with records of this kind.

The reasons why Wise Furnaces have sold themselves so thoroughly to our dealers and why today the name Wise has a bigger meaning to our thousands of warm air heating contractors than ever before are simple.

THE WISE

AKRON,

SE

WISE Furnaces are of that sound, honest, dollar for dollar value that any man can recognize.

Wise Furnaces are more than just heaters, they are the result of both practical experience and study of the correct principles of warm air heating and ventilating.

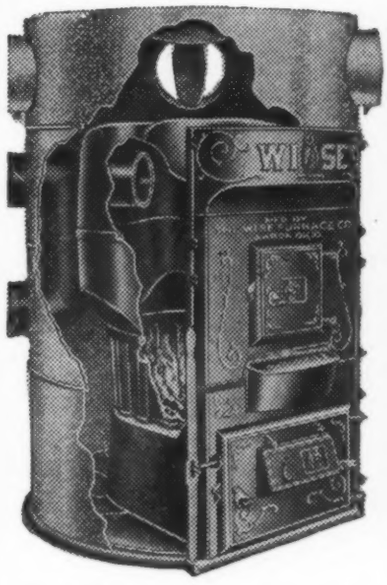
They are *good* warm air heaters and their practical features actually accomplish the desired results in saving fuel, labor and operating expense.

The "wise" dealer will look over the Wise Furnace proposition before signing up for 1923—just tell us you're interested.

Your name brings full detailed agency information together with catalogs, circulars and our price list.

FURNACE CO.

OHIO



The Wise Furnace possesses one easily seen distinction in warm air heating construction.

This distinction is not a "feature"—it is the quality and workmanship of the heater as a whole.

You will see this distinction in not only the first, but in every Wise Furnace that is shipped to you.

You ought to study the construction of the Wise Furnace in detail—see why its quality is such a big profit maker.

WIECHERT

BELLEVILLE ILLINOIS.

Red Front Furnaces

THE furnace that is going to give you the best profit next season—that's your question right now. That furnace will be the one that will give you the highest quality at a price that is consistent with quality yet *right*.

Production lowers cost and increases quality—the Red Front Furnace is *a quality product at a quantity price.*

A short examination will show you why this furnace is in demand. You don't sell a skimped product when you sell your customer a Red Front Furnace.

The illustrations give you an idea of their massiveness. The best grey iron obtainable is used, all the castings are extra heavy and the furnace as a whole is properly proportioned both for correct heating and long life.

Give your customers this better quality—with better profits

In the Red Front Furnace you'll find that ideal heater you want to sell and your customers want to buy.

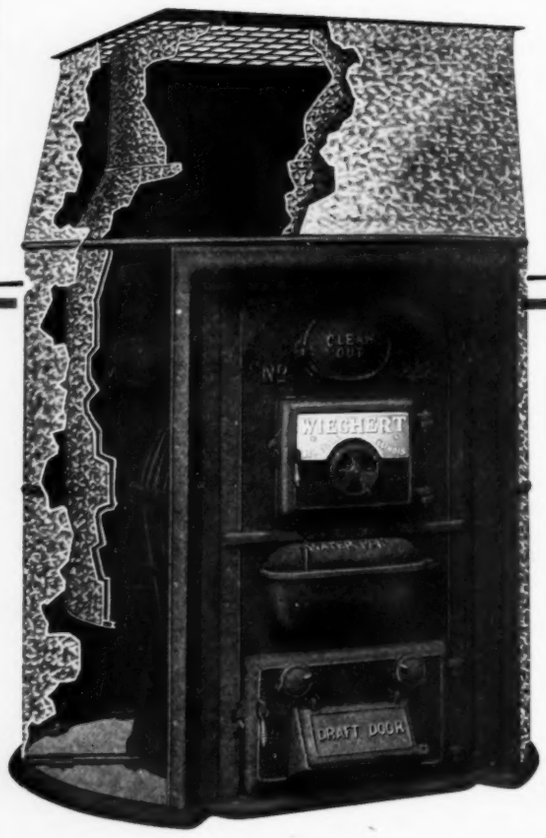
The many quality features are best explained in our catalog—write today and let us explain in detail this superior construction.

The Red Front agency for your territory should go to you—you'll want it when you compare Red Front quality and Red Front prices with your present line.

CHICAGO DISTRIBUTOR

Red Front Furnace & Supply Co., 149 W. Austin Ave., Chicago, Illinois

St. Clair Foundry Corporation
Belleville, Illinois



Pipe and Pipeless

Every Furnace fitted, mounted and examined before leaving foundry

PREMIER

of DOWAGIAC

THE Premier of Dowagiac with its many high quality and exclusive features truly represents the class of the warm air heating industry.

Let us tell you all about it—and its attractive price.

Make 1923 your Premier year—write today for interesting details and set of large photographs.

PREMIER WARM AIR HEATER COMPANY

Manufacturers of

PIPE AND PIPELESS WARM AIR HEATERS

Dowagiac, Michigan

AMERICAN
BOILER PLATE
WARM AIR HEATER

—profit on this heater's advantages

AND it has many, and these features are so distinctive, sound and convincing that sales come even easier than when you sell a lower grade, lower priced furnace.

For over twenty-five years the American Boiler Plate warm air heater has been making good profits and building good furnace businesses for our dealers.

Notice how this heater is made of heavy steel, riveted and calked like a power boiler. This construction makes it absolutely gas and soot proof and the steel guarantees your customers many years of clean and efficient heating service, without any danger of cracking.

And we do more than just take your orders—

Every dealer holding our agency gets real selling cooperation from us. Our method of helping is unusually successful in aiding our dealers to secure the bulk of the business in their territories.

Write today and let us tell you about our agency plan for 1923.

Have us send you our latest catalogs which illustrate and describe our complete line

AMERICAN FURNACE COMPANY

2719 to 2731 Morgan Street **ST. LOUIS, MISSOURI**

We also make

THERMO CAST IRON FURNACES AFCO ROOM HEATERS

THERMO PIPELESS FURNACES

GILT EDGE FURNACES

A NEW and *Even Better* Gilt Edge Furnace

A furnace that was built to meet the requirements of the furnace user and the heating contractor. It embodies those features of design and construction which recent scientific tests and research work, have proven best in furnace construction and most efficient in operation.

Unusually large amount of prime heating surface, Generous free air spaces, Large and properly proportioned casings, Smoke and gas proof joints, A large double door, Easily removable grates, Extra size water pan, Accurately fitting parts making the furnace easy to set up. A furnace that squarely meets every demand. It's going tolead the furnace field in 1923.

A BROAD and AGGRESSIVE SALES PLAN

Coupled with this new and even better Gilt Edge Furnace, is a big broad and aggressive plan of selling assistance to the dealer. An Advertising Campaign that thoroughly covers the territory served by Gilt Edge dealers. A sales service that will actually make it easier for you to sell Gilt Edge Furnaces. An Engineering Service that is yours to use without cost to solve any heating problem that you may be up against. A selling campaign that provides for the highest type constructive service to you and your customers.

We are going to show you a furnace so good, and a service so far reaching, that you cannot afford to let any other dealer have the Gilt Edge Agency in your territory.

Write us now for further particulars.

R. J. SCHWAB & SONS CO.

279 Clinton St. **Milwaukee, Wis.**

Get the business—

THAT'S what one hears from all sides these days. And the dealer who has been saying these three words to himself and figuring on how to *get the furnace business now* has been giving the subject of *what furnace* a great deal of attention. He has *found out* that *the furnace* he sells has to *measure up* and be *priced right.*

We hope you are in this critical frame of mind because we know the Titan Superheater will impress you even though our description is necessarily brief.

Examine the illustration and then—

Notice the massive construction (made from the purest grade of pig iron obtainable) the castings are extra heavy throughout. You have examined castings and said "like an egg shell." When you examine Superheater castings you'll say "like a cannon."

Every part is made to fit with all deep cup joints and notice—*fully capped.* The design is the most practical and up-to-date—every part from top to bottom a feature.

If you want a furnace, pipe or pipeless, that will "get the business" it's the Titan Superheater.

It more than satisfies our hundreds of live established dealers—it will pay you to have us give you the agency details right now. We are making prompt deliveries to all Middle West points.

TITAN
SUPERHEATER
FURNACE

Pipe and Pipeless

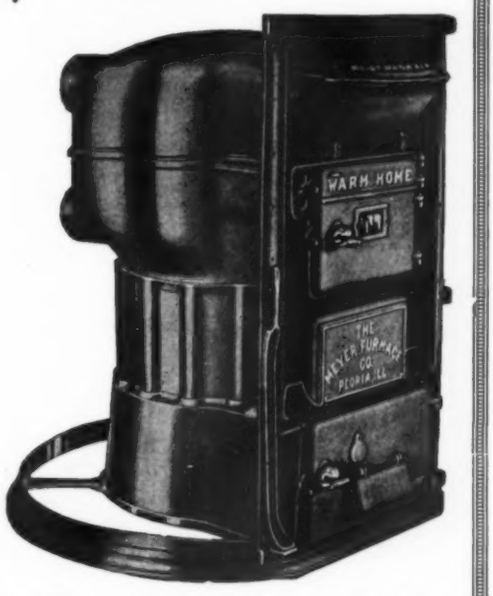
Write for our catalogs TODAY!

TITAN

STANDARD FOUNDRY & MFG. CO.
DEKALB, ILLINOIS

TITAN

The Warm Home Cast Furnace



and the

Warm Home

(Sectional Casing)

Pipeless Furnace

PATENT APPLIED FOR

TRUE to its name the Warm Home is a heater which really keeps the home warm.

The name "Meyer" on this cast furnace is assurance that it is high quality in all respects.

A powerful heater, absolutely fool proof, it is extremely heavy and massive in construction and it generates a maximum of heat from a minimum of fuel.

Clean, bright and live radiating surfaces, correctly placed water pan, large double feed door and extra heavy slotted fire pot. The slots and the fire pot are slightly larger at the bottom than at the top—this means self-cleaning and greater heating power.

Let us tell you all about these features and others—the ball bearing grate, the enormous heating surface dome, the diving flue, and our **air-tight, extra ring** casing joints.

Catalog A-21 tells you about the Warm Home in detail—write for it.

Secure the Warm Home Agency NOW!

The Sectional Pipeless Casing shown at the left with the Warm Home furnace is the biggest improvement in pipeless heating ever made for the user and you the installer. Only two casing rings and four bolts are used in erecting this perfect fitting equipment—no cutting is required and ——

←*You erect it in 20 minutes*

Each section is a part of the cold air chamber, with a single outer and a double inner wall. They make the tightest fitting, most perfectly constructed pipeless casing on the market, and besides save you much time and labor.

You'll want to install this better heater this better way with better profit——

Write now for the agency. RIGHT NOW!!

The MEYER FURNACE COMPANY

PEORIA, ILLINOIS

Lennox Torrid Zone Furnace

Pipe or Pipeless

These Jobbers can supply you and give you full details:

J. D. Johnson Co.
Philadelphia, Pa., Camden, N. J., Other Branches.

J. E. Wampler
Irwin, Pa.

The Elliott Heating Supply Co.
Denver, Colo.

Holly-Mason Hdwe. Co.
Spokane, Wash.

Washington Sheet Metal Works
Seattle, Wash.

Holbrook, Merril and Stetson
San Francisco, Calif.

Marshall-Wells Co.
Winnipeg, Canada

Blockie Heating Supply Co.
Oklahoma City, Okla.

Texas Heating and Ventilating Co.
Fort Worth, Texas

Bywater and Groo
Salt Lake City, Utah

GET right down to all the facts in choosing your line for next year—don't be satisfied with knowing just a *little* about the furnace—find out *all* about it.

The Lennox *Torrid Zone* Steel Furnace is nationally known and advertised—its sales are large and our many dealers are making good profits.

And the reason for this is that it is a *good* furnace.

We'll be more than glad to go into every detail of its manufacture, construction, long life and sales possibilities with you.

We want to show you what it will mean to you to sell the Lennox Steel Furnace—a steel heater with gas and air tight boiler riveted seams. A furnace that permanently seals gas and smoke within the furnace—that has the highest grade and type of grates, fire brick lining, direct and indirect drafts and numerous other features.

We have a booklet that tells the story of the Lennox Torrid Zone Steel Furnace—let us send it to you ***now***

The Lennox Furnace Company
200 Lincoln Highway
Marshalltown, Iowa

WRITE TODAY AND HAVE US TELL YOU ABOUT THE LENNOX AGENCY

1923

What wonderful opportunities lie ahead:

To give Service
To suggest Quality
To promote Efficiency

And it can all be done by

Being Industrious
Having Initiative
Developing Integrity
Working Intensively

OUR INSPIRATION is always to strive for the best and earn the good will of men. Our reward is in the confidence given us and the exchange of the land.

The "FRONT RANK" has served faithfully for thirty-four years. Its merit stands unchallenged. Its efficiency is unimpaired. Combined with a live dealer, it is a producer of friends and an increase in business.

You are interested so drop us a line for the details of our 1923 campaign.

HAYNES-LANGENBERG MFG. CO.
4058 Forest Park Boulevard
ST. LOUIS, U. S. A.

The NEW FLORAL CITY FURNACE

Notice these SPECIAL FEATURES!

1. One hundred to three hundred per cent more direct heating surface.
2. More rapid circulation of air.
3. Better combustion of smoke and gases.
4. Large double feed door.
5. Greatly increased durability.
6. Tripleflued downdraft radiator.
7. Convenient and efficient air moistener.
8. Smoke pipe can be taken off at any angle.
9. Flat or triangular grates, interchangeable.
10. Perfectly suited for burning any fuel.

Direct Draft Damper Rod — One Piece Cast Dom

The immense direct heating surface and correctly designed radiator

enable the New Floral City to give much more heat for the fuel consumed than any other types of furnaces.

The radiator is a single piece casting and provides both a direct and indirect draft controlled by a damper.

Notice from the illustration the fire travel—all surfaces are heated equally.

A heater of real merit with a growing demand

The trade and the public have steadily increased their demand for this exceptionally efficient, economical and quality constructed heater.

Live dealers who want to sell a furnace that will give real service and more value will start selling the New Floral City Furnace NOW.

It will pay you to read over our interesting illustrated catalogs and circulars which describe the entire Floral City line in detail.

Write today for the most interesting agency proposition ever offered you

The Monroe Foundry & Furnace Company

Monroe, Mich.

Makers of High Grade Furnaces for over Forty Years

Direct Draft Damper Rod — One Piece Radiator

At the right

The New Floral City Furnace with casing. Notice how the deep fluting projects the heating surface into the air chamber without anything to interrupt the rapid circulation through the casing.

At the left

we illustrate the Floral City Queen Furnace. Write for circulars giving special features which show why this furnace is the superior one of this type.

AN OLD FRIEND—

IN A NEW DRESS!

QUICK HEATER LINE
QUICK SERVICE

Reg. U. S. Pat. Office

YOUR old friend in a new dress—The Quick Furnace and Supply Company, successors to B. H. Quick & Son—includes the old organization with new members and service facilities added.

YOU can now receive "Quick Service" shipments from a complete stock of Quick Heater Furnaces (Pipe or Pipeless), Quick Heater Registers and Fittings, Hart and Cooley Registers, Excelsior Pipe and Fittings, now being carried at Des Moines—a direct shipping center. This will help your trade.

YOU will receive from Quick Salesmen a distinct personal co-operation in both sales and installation work. A "Quick Service" headed by an Expert Heating Engineer will be at your disposal, for drawing up your plans and estimates.

"Quick Heater" Registers
Packed and labeled—one to a carton.

800 SERIES QUICK HEATER FURNACES

USE this "Quick Service" in sales — shipments — installations—for the development of your business. It will pay you. Just say you're interested. We'll Call.

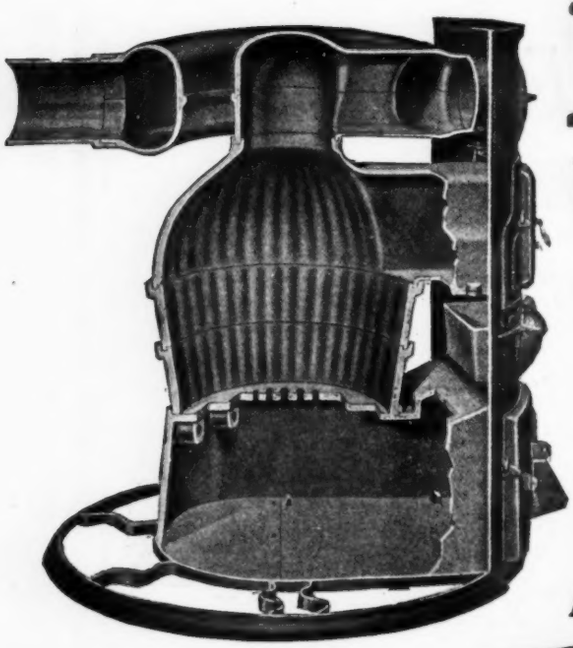
QUICK

FURNACE & SUPPLY

COMPANY

DES MOINES, IOWA

"Quick Service"



MASTER

Reg. U. S. Patent Office

WARM AIR FURNACES

PIPE AND PIPELESS

THEY are reliable. Notice the simple, sturdy construction. Weights are properly proportioned; the greatest weight being in the castings subjected to the greatest strain.

We guarantee a perfect fit. You can save money on installation cost by selling the MASTER. All MASTER dealers will tell you so.

MASTER prices are attractive. You can make your estimates low enough to land the jobs and still give assurance of a high grade furnace when figuring the MASTER. Write today for catalog and net prices.

Here's the MASTER Pipeless Construction

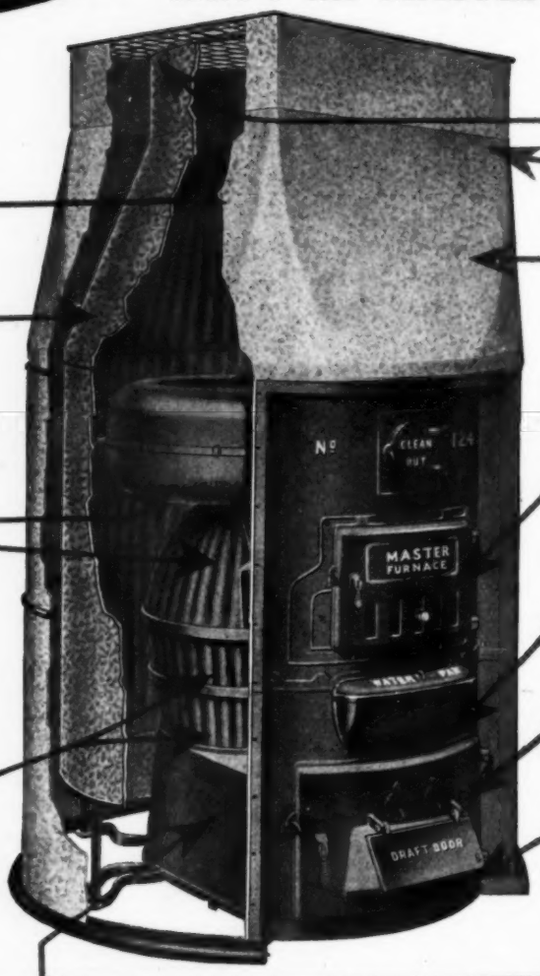
INNER CASING is made of two sheets of galvanized steel riveted together with a layer of asbestos between, the inner sheet is corrugated which provides a dead air space. This onstruction thoroughly insulates the cold air chamber and assures unimpaired air circulation.

COLD AIR SPACE is large and properly proportioned between the inner and outer casings.

RADIATOR is exceptionally large. Has more radiation surface than any other radiator of its type. Soot cannot lodge in it and impede radiation. Joint is made permanently tight by the use of heavy bolts placed at close intervals.

COMBUSTION DOME built extra heavy to withstand the constant strain of flames striking against it. The opening at the top is large enough to admit the passing of the burning gases into the radiator and yet not so large as to allow the gases to rush out unconsumed. A pocket is cast into the side of feed section so that the water coil when installed will not interfere with filing.

TWO-PIECE FIRE POT allows for expansion and contraction. Made extra heavy and corrugated to give increased radiation surface. The cup joints are deep and are permanently sealed with asbestos cement when erected.



Combination cold and warm air REGISTER is properly proportioned and attractively finished.

REGISTER BOX is adjustable to any height floor.

OUTER CASING made of a heavy weight galvanized steel.

FIRE DOOR made extra large to permit firing large chunks of coal or wood.

WATER PAN is of ample capacity so placed that the water evaporates rapidly. This produces a balmy warm air conducive to health and comfort. Handy to fill.

ASH-PIT DOOR is well fitted and full width of ash-pit for convenience in removing ashes.

DRAFT DOOR is large and adjusted by a convenient regulator plate placed in one of the rooms above.

Large, roomy ASH-PIT. Joints are deep and fit tight, allowing no dust or dirt to escape into the air chamber. The grate bars are hung into cored pockets of the ash-pit. This grate construction affords a substantial bed for the fire, the fire not touching the grate supports at any place. There are no grate rings, cotter pins or bolts to burn out. Clinkers are either dislodged or ground up by the action of the bars in revolving when the shaker is operated. Either of the bars can be removed in an instant from the ash door.

The
MASTER
PIPELESS

USES less fuel for results secured than any other system. Letters we have from many users testify to this. They would interest you.

Make 1923 a MASTER year. The proven MASTER high quality and reliability has made many new dealers. Let us show you.

Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.

The Weir Steel Furnace

GAS AND SOOT CONSUMING

★ Here's how your customers get full heating value from the fuel burned in the WEIR—notice the "gas draft" below the feed door—this lets the air rush in.

★ Now look at the patented WEIR fire pot—it allows the air taken in to circulate around it, meanwhile becoming heated—then the air flows in thru the holes at the top of the fire pot.

★ The result of this pre-heated air flowing right above the fire causes complete combustion. You can actually see the smoke and gases burning by looking thru the window in the feed door of a WEIR Furnace in operation. And then—

★ The extra drum or "radiator" at the rear gives added fire travel and more radiation—more heat from less fuel.

The WEIR "Does Save Coal"

The WEIR is the ONE furnace that successfully burns the gas and soot. That's a broad statement but it's a fact. This feature in the WEIR is not an *addition* or an *afterthought* but a distinctive construction point of the furnace itself.

Heavy steel construction; welded seams; large, correctly placed water pan and other numerous features combine to make the WEIR the undisputed topnotch furnace.

The WEIR'S organization backs up the WEIR Furnace and its agencies—a strong, extensive and practical dealer help campaign is always working and our engineering department's experts are always at your disposal.

These details are interesting and we'd be glad to have a district representative call on you to explain them—or if you prefer we'll mail you our printed matter which gets down to all the facts on the WEIR and Warm Air Heating.

The WEIR agency plans and prices for 1923 are ready—write for them NOW

The MEYER FURNACE COMPANY

Peoria, Illinois

This space reserved

for the

A. P. HARDER FURNACE CO.

OUR company has been thoroughly reorganized.

Our large modern factory, which was built in 1919-1920, and which is one of the finest equipped in the country, has been made ready for large production.

We are almost ready to start making our new furnace, which will be an exceptionally heavy, high class competitive furnace.

Jobbers and the Larger Dealers will find the *new* HARDER FURNACE an unusually good profit maker

This is a *new* furnace—it has many improvements and high class features and its high quality throughout for the price we quote will surprise you.

We wanted to show you in this space just what this new Harder furnace looks like, but the patterns are now in the stage of completion and actual production will start the later part of January.

WRITE TODAY and we will send you illustrations and catalogs of this new Harder Furnace as soon as they are ready—together with our prices.

Geo. B. Carr
President and Gen. Manager

A. P. HARDER FURNACE COMPANY
ROCKFORD, ILLINOIS

RED CROSS FURNACES

The Red Cross Empire Pipeless gives satisfaction and profits

IT IS built to deliver an over-abundance of warmed air — the construction is scientific and practical so that with the Red Cross Empire Pipeless you can guarantee perfect operation and continuous circulation of warm air.

As for the material quality—the best of clean high grade pig iron is used and all parts fit snugly.

It is made to last a lifetime and give real economical heating service.

60 years of experience behind this heater

For over a half a century we have been making only high quality goods. The Red Cross Trade Mark stands for 1st quality always and that's what you can expect and get in the Empire Pipeless.

The same identical heater that is used in the famous Empire Pipe furnace is used in the Empire Pipeless—you can guarantee satisfaction. Red Cross Warm Air Heaters — pipe and pipeless — dominate the field.

The line is complete—at a price that is always as low as quality will permit—and your profit is always right.

If the agency for Red Cross Furnaces in your territory is open you should get it. Let us talk it over.

Red Cross Welcome Combination Ranges

THE Red Cross Combination Range Illustrated is furnished with enameling in grey, or plain black. All our enameling is done in our own plant.

Its simple, sound construction and many of its features are apparent at the first glance. Your customers can see that it burns either coal or gas—that they are really getting two stoves for the price of one—that its trimmings are high grade and easy to keep clean and that it is made by a company that has been making high grade stoves and ranges for over sixty years.

The Red Cross Line enables you to offer your range prospects the highest grade combination ranges on the market, no matter what size or style may be desired.

Let us send you our latest illustrated catalogs covering the entire Red Cross Line Now.

CO-OPERATIVE FOUNDRY COMPANY

ROCHESTER, NEW YORK

CHICAGO BRANCH—505 So. Clinton St. *BOSTON BRANCH—357 Washington St., Dorchester*

Manufacturers of the Celebrated Red Cross Ranges and Furnaces.

HERO AIR-WASHER HEATING SYSTEMS

PIPE AND PIPELESS

SELL Hero Air-Washer Heating Systems—Please and satisfy your customers by giving them a heating plant that not only Heats but *Washes* and *Purifies* the air.

Clean, moist air is an insurance against colds and winter ailments. In addition, Dr. Herman Briggs, State Health Commissioner of New York tells us that "moist air at 68° feels warmer than dry air at 72." Therefore, by applying the Hero Idea to their heating problems your customers not only insure their good health, but simultaneously reduce their coal bills.

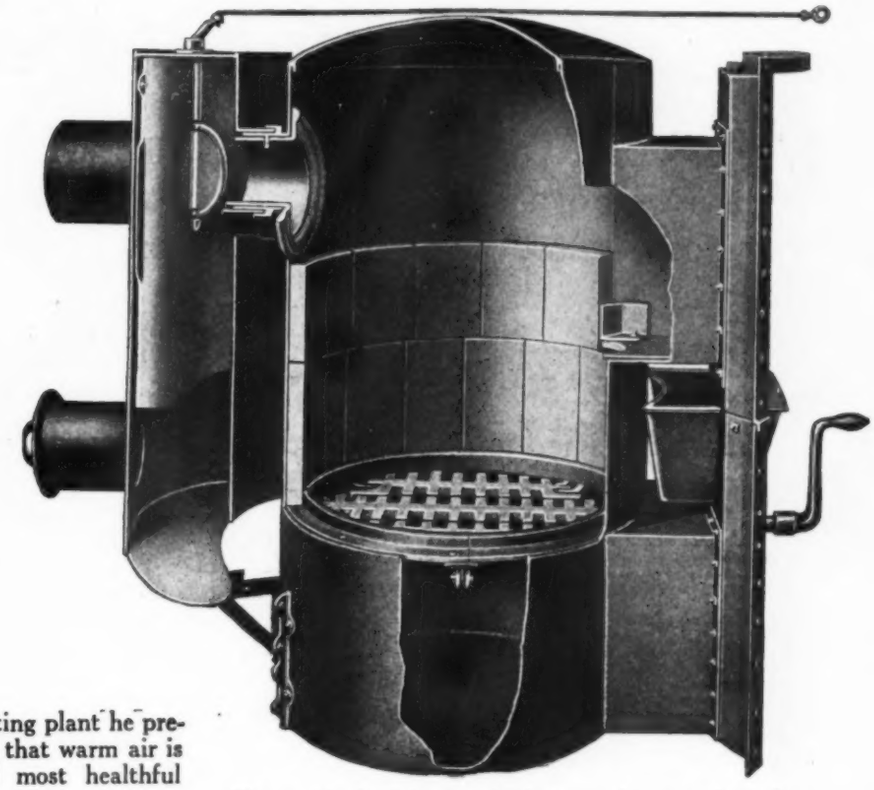
ASK for our dealers' proposition. It is exceptionally attractive. Our plan includes the furnishing of road signs, motion picture slides, house signs, banners, an advertising allowance based on purchases, and personal sales help whenever it is needed.

In selling Hero Air-Washer Furnaces you represent a well-known line, and our practical selling and installation co-operation is a part of our obligation with every Hero Agency.

Write today for our illustrated catalog and complete proposition

HERO FURNACE COMPANY, *Sycamore, Illinois*

Folks Want CLEAN *Heat!*



That's why you can sell the SEAMLESS WATERBURY *at a profit!*

ASK any man what type of heating plant he prefers. He will probably admit that warm air is the quickest, most economical, and most healthful system.

But he objects to the gas, dust and smoke long associated with warm-air furnaces. So he spends more for a hot water outfit, that's slower to heat and costs more for fuel and to keep in repair. **Mainly to get clean heat!**

The Waterbury dealer guarantees his prospect a Gas-tight installation, and because he meets the only legitimate objection to Warm Air, he sells furnaces **at a profit** in the face of cheap competition. This he cannot do with another furnace, no matter how good it is, because he can't show his prospect that his furnace is worth the extra money.

THE WATERBURY *SEAMLESS* FURNACE

PIPE OR PIPELESS

The Waterbury is a heavy high grade furnace, made right. The Waterbury is therefore, durable, easy to install, an efficient heater that supplies Clean Warm Air free from ash dust, coal gas and smoke, not for a year or two, but during its whole long life.

Body is of heavy steel, all parts welded into one seamless piece by the oxy-acetylene process. Even the feed and ash chute and the ashpit bottom are welded in.

Radiator is of the same welded steel construction.

Front is of cast iron with doors carefully fitted. Firepot lined with fire brick.

Large combustion space, straight side firepot and long downdraft fire travel to insure fuel economy.

Waterbury Seamless Furnaces are distributed from our own or jobbers' warehouse stocks at the following points:

Minnesota	Minneapolis & Duluth
Wisconsin	Green Bay
Indiana	Indianapolis
Pennsylvania	Harrisburg & Pittsburgh
Missouri	Kansas City
Colorado	Denver
Utah	Salt Lake City
Washington	Spokane - Seattle

Our proposition is making money for dealers. Write for it!

The WATERMAN-WATERBURY CO.

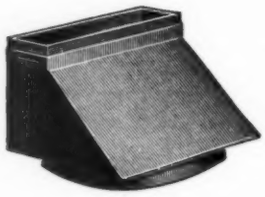
MINNEAPOLIS, MINN.

A Complete Line for Complete Satisfaction

EVERYBODY has got to be satisfied if you are to do a satisfactory furnace business, and everybody is sure to be satisfied if you handle the Moncrief Line of Furnaces, because

Your customer is satisfied with Moncrief efficiency and economy.

He is satisfied with the Moncrief combination of low cost and high quality.



You are satisfied with the wide margin of profit,—

and the dependable Moncrief Service that promptly delivers any kind or size of Moncrief Furnace you want on short notice.

Moncrief Furnace means "Heating Satisfaction Guaranteed."

The Henry Furnace & Foundry Co.

Cleveland, Ohio

Foundries at Medina, Ohio and Chagrin Falls, Ohio

MONCRIEF

Warm Air Heating Pipe and Fittings

—Always dependable—complete the Moncrief line We make everything needed on a warm air heating job and sell it at the lowest prices consistent with high quality. A large stock of all sizes insures prompt shipments.

Be sure you have our big Pipe and Fittings Book.

MONCRIEF

PIPE, PIPELESS, THREE PIPE AND MAJESTIC MONCRIEF

FOR ALL WARM AIR HEATING NEEDS

Start After the Spring Business Now

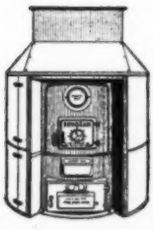
Next spring bids fair to break all records for home-building. The furnace dealer's opportunity for sales and profits will be greater than ever.

But the dealer who gets the biggest share of the business in your locality will be the one who starts after it *now*. For prospective home-builders are already working with architects and contractors. Estimates are being prepared, plans are being drawn, heating systems are being specified.

If you handle the Sunbeam Furnace Line you can go after this business with strong competitive advantages. Into every Sunbeam Furnace you sell and install goes the best of materials, the finest workmanship and 30 years of experience in manufacturing furnaces *exclusively*. You are handling a furnace that sells easily, installs easily and keeps itself sold by long and efficient heating service in the home. You can provide a furnace—either pipe or pipeless—to meet every home-heating requirement.

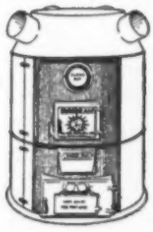
You have a real price advantage, too. You can offer a quality furnace at a remarkably low price because Sunbeam Furnaces are manufactured and placed in the dealer's hands under a policy of volume production and small manufacturing profit per unit.

You are dealing with a furnace manufacturer equipped and willing to give you the broadest kind of co-operation in the building of a permanent and profitable business.



Write today for dealer literature, together with prices, discounts, etc.

The Fox Furnace Company
Elyria, Ohio



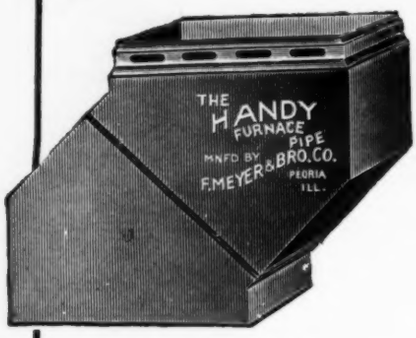
SUNBEAM

PIPE *and* PIPELESS FURNACES

You get a better buy from Manny

Furnaces
Registers
Pipeless
Gratings
Furnace
Pipe and
Fittings

Smoke Pipe
Wood Faces
Damper Clips
Asbestos Paper
Paste—Cement
Furnace Chain
and Regulators



MANNY FURNACES

Piped or Pipeless

HANDY FURNACE PIPE

JONES-NATIONAL REGISTERS

EVERLASTING
CAST IRON SMOKE PIPE

WE'RE all set to take care of your needs for 1923—with everything from High Grade Furnaces to High Grade Furnace Cement.

Let us give you details on our entire up-to-the-minute line—*our low prices can't be beat.*

We have built up our business by giving good service—the kind you want—along with this high quality and right prices.

We carry complete stocks of the leading lines and can fill your demands for prompt shipments.

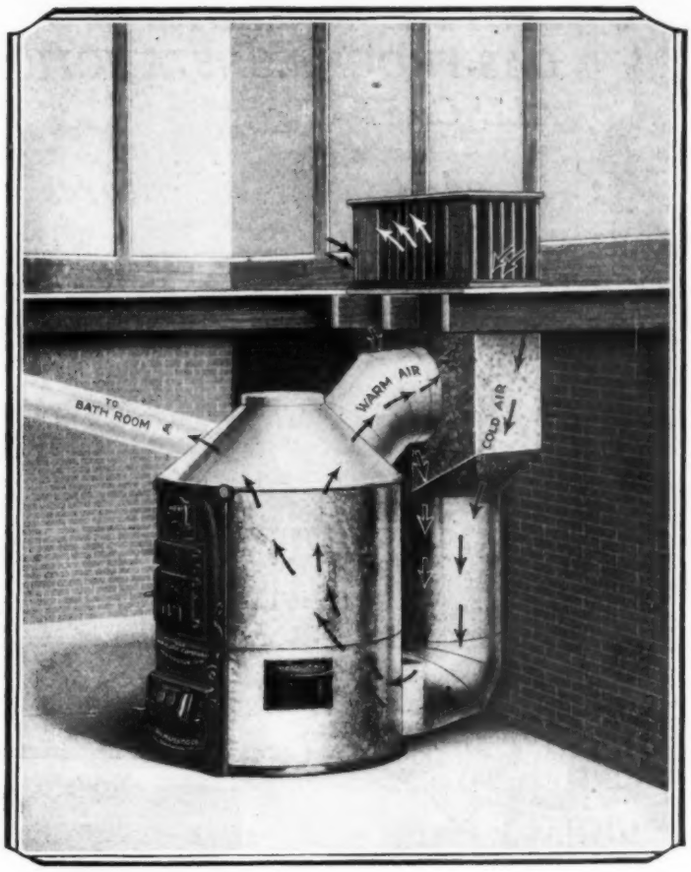
If you want to know why our business has doubled since last year let us quote you prices on material for your next job.

Write today for our illustrated catalog and circulars. Get our prices now—then "Order from those furnace people"

The Manny Heating Supply Company

131 W. Lake Street - - - - Chicago, Illinois

Majestic
DUPLEX HEATING SYSTEM



10 Advantages

1. Register locates against a wall out of the way.
2. Register harmonizes with room furnishings—the top and panels are in quartered oak, mahogany or craftsman leather finish.
3. Register occupies about one-half less floor-space than a floor-level register of equal capacity.
4. Avoids necessity for cutting hole in center of room—does not interfere with rugs.
5. Diffuses heat out into the room instead of shooting it directly to ceiling.
6. Circulates heat more evenly and reduces objectionable floor drafts.
7. Register is sanitary and clean—does not become a receptable for dust and dirt from sweepings.
8. Does not limit furnace to one register, if you need others.
9. Makes furnace more efficient—insures maximum fuel economy.
10. Overcomes every objection to floor level one register system.

Let Majestic Advantages Make Money For You!

HERE is a heating system with *all* the *advantages* of both the "pipe" and "pipeless" systems, without the *disadvantages* of *either*. It is the Majestic Duplex Heating System, which consists of the Majestic Standard Furnace and the Majestic Duplex Register Unit.

The Majestic Duplex System is not a "pipeless" system—nor is it an ordinary "pipe" system. It is a combination of the best features of both. And its greater efficiency is due to the fact that it passes a larger volume of warm air with much less friction to the air travel.

The Majestic Duplex System is not limited to one Majestic Duplex Register. And direct branches may be taken from the furnace to the bath room, bed rooms or other rooms set off from the main part of the house.

Thus the Majestic Duplex System has the flexibility of the "pipe" system. In addition, it saves cutting a number of holes in the floor—eliminates from two to four friction producing pipes—and gives more space in the basement.

These advantages are making money for Majestic dealers. They will make money for you. Write today for full information and our attractive dealer's proposition.

THE MAJESTIC COMPANY, HUNTINGTON, IND.

For Soft Coal the Farris Is Supreme

SELF-CLEANING RADIATOR
HOT BLAST DRAFT
AIRTIGHT DOORS
SLOTTED FIREPOT
GAS-PROOF CONSTRUCTION
ALL CAST

Add to these Features

THE WATERBASE

and you have

A Furnace which Stands Out Above the Competitive Scramble

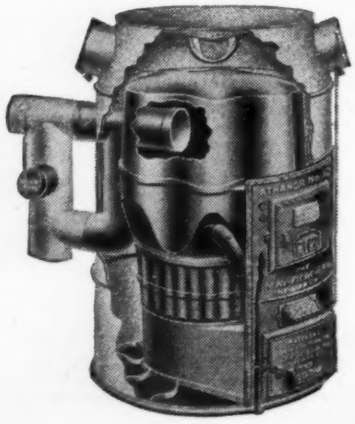
For Further Information Write

FARRIS FURNACE CO.
SPRINGFIELD, ILLINOIS

THE PIPE AND ATH-A-NOR PIPELESS FURNACE

The Furnace with the THREE-WAY AIR BLAST

Making the Ath-A-nor an exceptionally Powerful—Efficient and Economical heater.



The Ath-A-nor line will give you the three chief essentials concerning your profits, namely

Quality—Efficiency and Sales Results

Let us show you the Ath-A-nor furnaces in detail—then become one of our satisfied dealers.

The MAY-FIEBEGER FURNACE CO.
NEWARK, OHIO

NIAGARA FURNACES

YOU can make a good margin of profit selling these good quality furnaces.

They are made entirely of clean, high grade pig iron especially adapted for furnace making.

This metal expands and contracts without danger of cracking.

Durable, Efficient and Economical

Our catalog gives the details of their many features of construction — write for a copy today.

An unusually profitable proposition is waiting for you in our agency for 1923.

The Forest City Foundry and Manufacturing Co.

1220 Main Avenue

Cleveland, Ohio

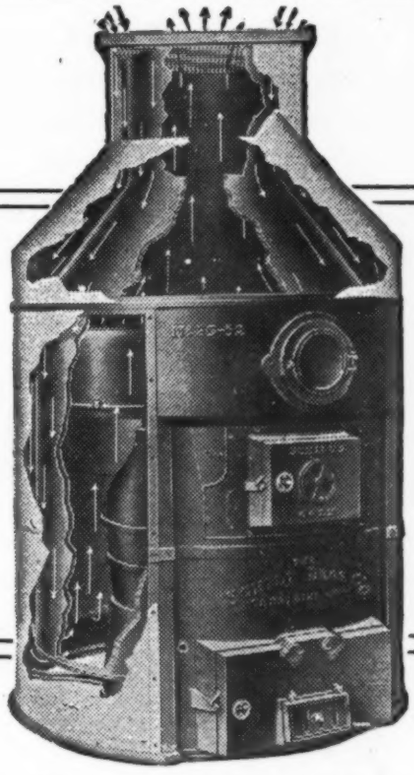
We are also makers of the Monarch Furnace

SCHILL'S

Warm Air Furnaces

Get the Agency for 1923

The Schill Pipeless



Quality Heaters Since 1892

THE dealer who takes on the Schill agency secures a connection that is sound and reliable.

The Schill line of Warm Air Furnaces is complete, a quality heater for every customer, a size and style to suit at a reasonable price.

Highest grade, extra heavy and superior construction, with the best of tried and true features.

Our dealers are backed up with heaters that are *guaranteed* to be good quality.

We have an agency sales plan that is bound to interest you. Let us tell you about it NOW.

Write today for our illustrated catalog which lists and describes Schill Warm Air Furnaces in detail.

The SCHILL BROTHERS CO.

CRESTLINE, OHIO

PROFIT MAKERS
FOR WESTERN DEALERS

It's surprising the number of dealers who voluntarily tells us about the profits they are making by selling our line of furnaces —exclusively.

Of course we have several grades and styles of furnaces, to fit the various pocket books and demands of the consumers and then, too, our service and prices are exceptional, so it's no wonder our dealers are enthusiasts and stay with us year after year.

You also can share in these profits. Drop us a postal and one of our salesmen will call and explain in detail our service and sales plan.

STANDARD FURNACE & SUPPLY CO.

Nesbit All-Cast **FURNACES** Weir All-Steel

Omaha, Nebraska *The Best in Furnace Supplies* Sioux City, Iowa

SCHEIBLE
Warm Air Heaters

YOUR customers, when they buy Scheible Warm Air Heaters from you, get more than they pay for and you get more than a mere cut and dried profit.

You get satisfied customers who boost their heaters, boost you and your business.

Let us send you our catalog and agency details.

SCHEIBLE-MONCRIEF HEATER CO.
1444 West Ninth Street
CLEVELAND, OHIO

1. *Old-fashioned good quality, sound construction and time-tried features.*
2. *For over thirty years good business builders for our dealers.*
3. *Built to give unusually good service and liberal profits.*

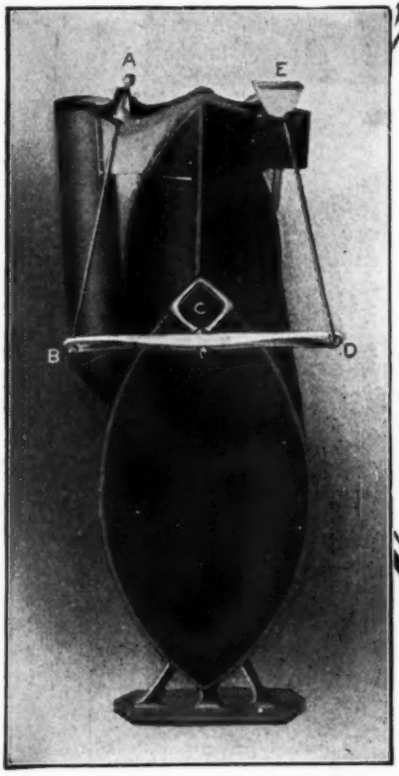
PATTERNS
FOR STOVES AND HEATERS FIRST-CLASS IN WOOD and IRON
VEDDER PATTERN WORKS ESTABLISHED 1836 TROY, N. Y.

PATTERNS FOR STOVES AND HEATERS
THE CLEVELAND CASTINGS PATTERN COMPANY
CLEVELAND, OHIO

IRON AND WOOD
STOVE PATTERNS
QUINCY PATTERN COMPANY
QUINCY, ILLINOIS

Read the Wants and Sales Pages

FarQuar Automatic Control
—and What It Means



One of the first questions a home-owner should ask about a heating system is—"does it control the fire easily and successfully?"

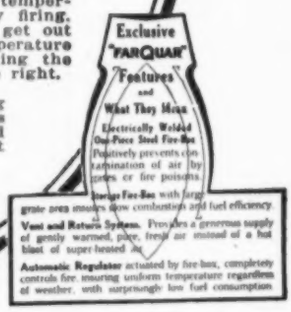
In other words, do the drafts operate automatically and help to economize fuel?

The answer is a positive "YES!" with—

THE FARQUAR SANITARY HEATING AND VENTILATING SYSTEM

The expansion and contraction of the FarQuar one-piece firebox—electrically seamless-welded to make it gas and air-tight—is the actuating force of the FarQuar Automatic Control. A cold frame is fitted around the firebox outside the casing (shown in illustration at left) and so adjusted that the slightest variation of temperature causes the governor arm to automatically open and close the draft and doors.

The result is a complete control of the fire, giving uniform temperature with only once-a-day firing. No springs or batteries to get out of order. The desired temperature is obtained merely by setting the simple device shown at the right.


Exclusive "FARQUAR" Features and What They Mean
Electrically Welded One-Piece Steel Fire-Box
Positively prevents contamination of air by gases or fire poisons.
Storage Fire-Box with large grate area insures slow combustion and fuel efficiency.
Vent and Return System. Provides a generous supply of gently warmed, pure, fresh air instead of a hot blast of superheated air.
Automatic Regulator actuated by fire-box, completely controls fire, insuring uniform temperature regardless of weather, with surprisingly low fuel consumption.

The FarQuar is the only heating system made possessing these exclusive features. Other distinctive FarQuar features are described in our free booklet. Write for it. Dealers should ask about the FarQuar Franchise for their territory. It carries a decidedly profitable advantage for them.

The Farquhar Furnace Company
201 FarQuar Building
WILMINGTON, OHIO

The New Peninsular Warm Air Furnace

We Are Now Closing Contracts For 1923 Agencies.

WRITE today for our latest catalog and let us tell you all about it.

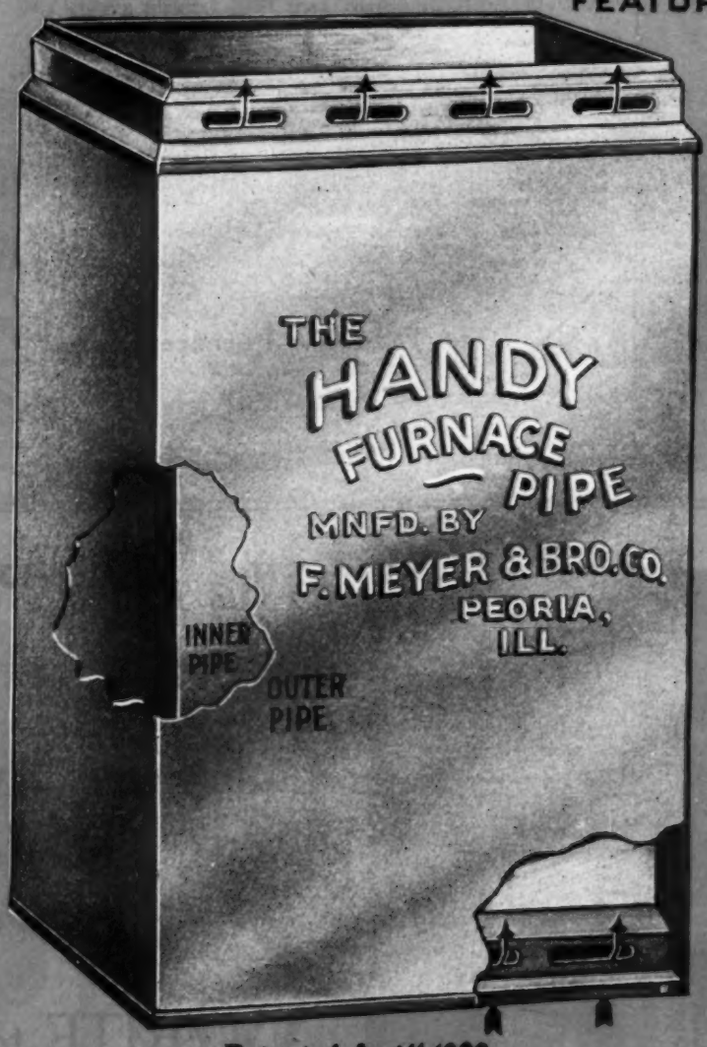
***The* Peninsular Stove Co.**
Detroit Chicago New York

"HANDY" FURNACE PIPE AND FITTINGS

SHOWING

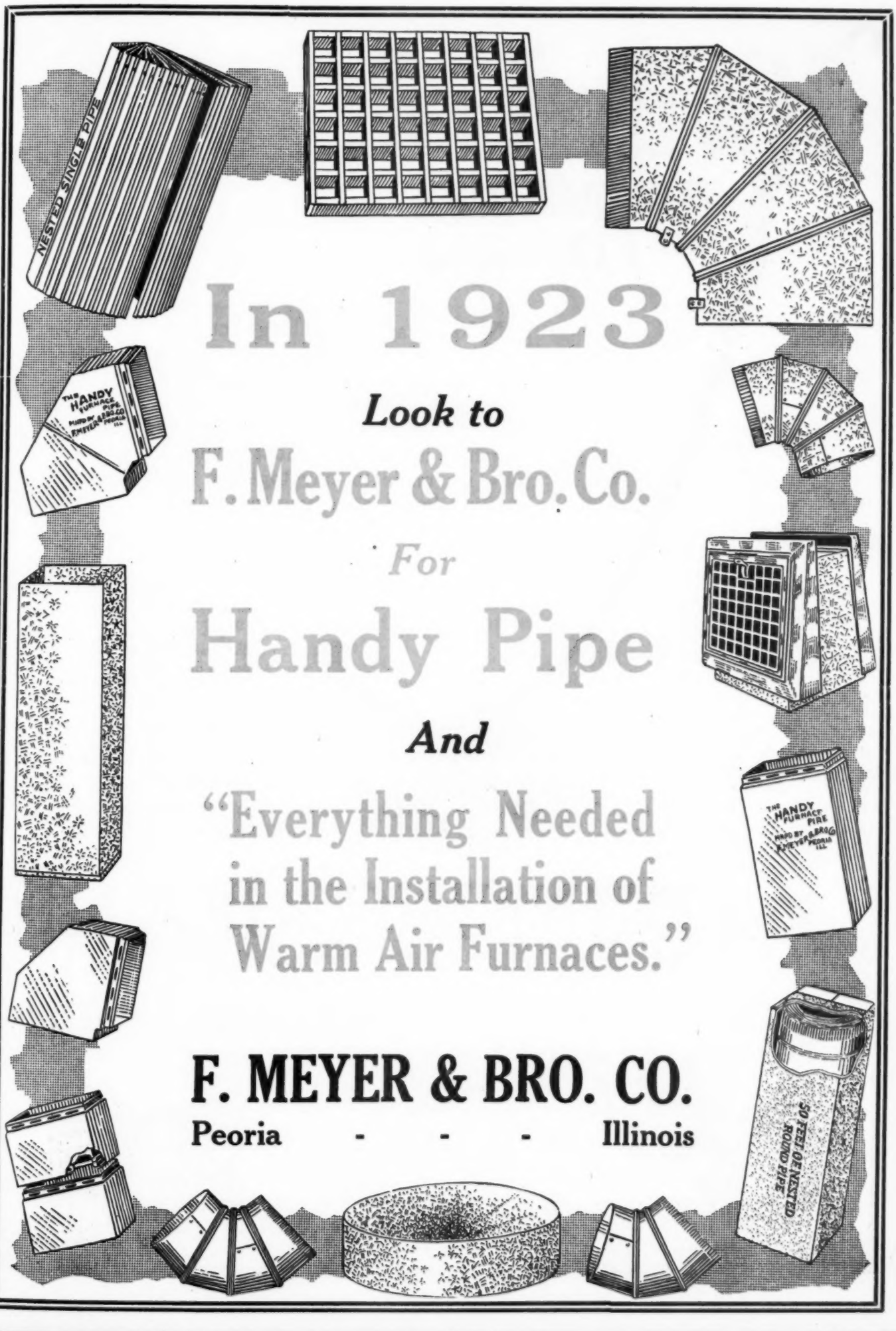
"Handy" Construction

FEATURES



Patented Aug. 11, 1908

DOUBLE-QUICK, DOUBLY-SAFE INSTALLATION


NESTED SINGLE PIPE
THE HANDY FURNACE PIPE
MADE BY F. MEYER & BRO. CO. PEORIA ILL.
THE HANDY FURNACE PIPE
MADE BY F. MEYER & BRO. CO. PEORIA ILL.
50 FEET OF NESTED ROUND PIPE

In 1923

Look to

F. Meyer & Bro. Co.

For

Handy Pipe

And

"Everything Needed in the Installation of Warm Air Furnaces."

F. MEYER & BRO. CO.

Peoria - - - Illinois

Kwik-Lok
FURNACE PIPE AND FITTINGS

YOU can take a long section of Kwik-Lok pipe in one hand—with your thumb on top of one flat side and your fingers on the bottom of the other flat side and it won't buckle—you can drop a Kwik-Lok Adjustable Elbow or handle it roughly without having it come apart—it's made to stay together tight—yet you never found an elbow that adjusted so easily.

"The House of Service"

BESIDES manufacturing Kwik-Lok pipe we can furnish you anything you need—from furnaces down to furnace cement. All high grade goods at right prices. Write for our complete catalog.

WRITE FOR CATALOG

Let us send you some sample sections

Tell us you want to get your hands on a couple of sections of Kwik-Lok to see if it's what we say it is.

Let your experienced eye see the time saving and profit making values of Kwik-Lok construction.

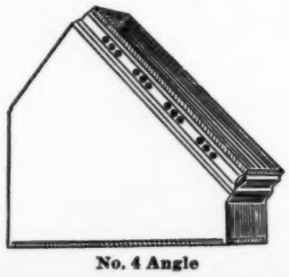
Write today—

The DUNNING HEATING

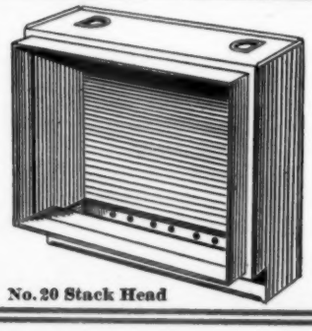
"The House

131-133 Reed Street

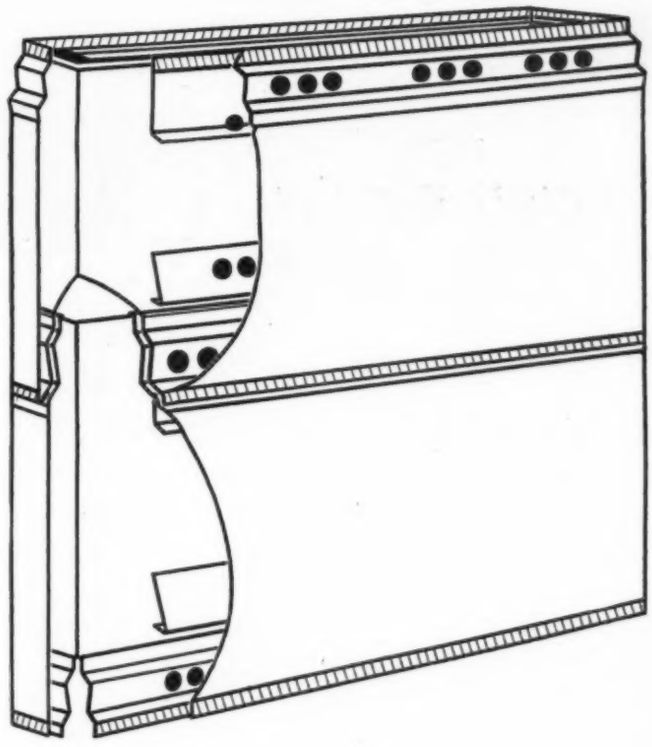
Adjustable Boot



No. 4 Angle



No. 20 Stack Head



Note This
Superior Construction

THE
Snappiest Furnace Pipe
on the
Market

A heavier pipe and mechanically perfect

THAT'S what Kwik-Lok is. Kwik-Lok has the longest connecting joint of any pipe on the market with the inner and outer sections each in one continuous piece.

The Kwik-Lok locking device securely locks the sections—you install this pipe entirely without the use of solder or brads.

Kwik-Lok is mechanically perfect pipe—a true saver of time and its supreme quality has set a new standard.

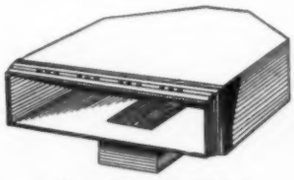
Start now to make better installations by using this better Kwik-Lok pipe. Its quality is the highest—yet it is economical—let our illustrated catalog and price list tell you more.

SUPPLY COMPANY

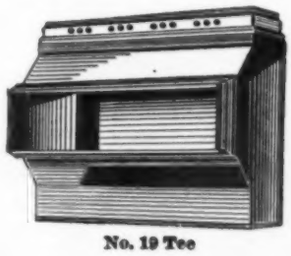
of Service"

Milwaukee, Wisconsin

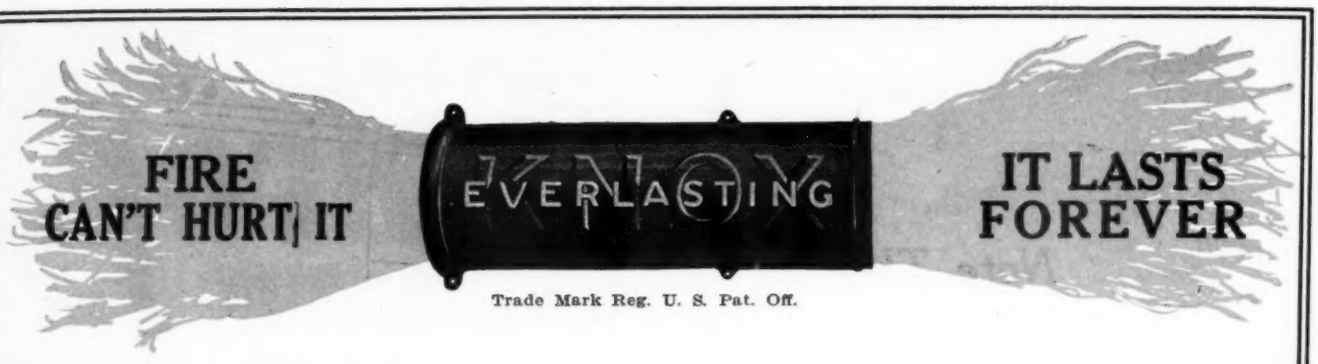
3-Piece Adjustable Elbow



No. 36 Reverse Elbow



No. 19 Tee



Trade Mark Reg. U. S. Pat. Off.

Install this smoke pipe on every job It gives you more profit and satisfaction

IS THERE any profit in replacing burnt out sheet metal smoke pipe for your customers? Hardly, it causes dissatisfaction for them and takes a lot of your time ***in the busy season*** and your profit is small.

Smoke pipe ought to last, it ought to be made of ***cast iron*** so it will ***withstand heat*** and ***not rust*** or ***corrode.***

Knox Everlasting Cast Iron Smoke Pipe is that kind of smoke pipe—it ought to be included in your estimates—you point it out as a part of careful lasting work and the wise home owner will readily buy it to replace his burnt out, fallen down sheet metal smoke pipe.

It's easy to install and it stays up—comes in varying lengths with elbows 22½ to 90 degrees—will fit into any space.

Write today for descriptive circulars and prices

It Will

—last as long as the furnace.

—be installed easier and quicker.

—do away with profitless sheet metal smoke pipe jobs.

—satisfy your customers.

Order From Your Nearest Jobber

Manny Heating Supply Co., 131 W. Lake St., Chicago
Omaha Stove Repair Works, Omaha, Neb.
Wm. Warnock Co., Sioux City, Iowa
Lincoln Stove Repair Works, Lincoln, Neb.
Leighton Supply Co., Fort Dodge, Iowa
Field and Shorb Co., Decatur, Ill.
Cutler Hardware Co., Waterloo, Iowa.
B. H. Quick & Son, Des Moines, Iowa
A. Y. McDonald Mfg. Co., Dubuque, Iowa

It Won't

—burn out.

—rust or corrode.

—fall down.

—scale or crumble.

—cost your customers as much as galvanized pipe in the long run.

—ever have to be replaced.

WATERLOO REGISTER CO., *Waterloo, Iowa*

Indianapolis, Ind., 706 City Trust Bldg. - Seattle, Wash., 90 Blanchard St.

KNOX *EVERLASTING*

CAST IRON SMOKE PIPE

FURNACE FAN CORPORATION

MANUFACTURED
SENSITIVE CIRCULATION POSITIVE
WALES FURNACE FAN
DOWAGIAC, MICH.

A Furnace-Fan

Energizes Your Warm Air Furnace

Silent — Automatic

Perfect Humidity Control

—Also—

Supplies Domestic Hot Water

Self-Operated

No Electrical Connections

Write Today for Your Agency

Increases the Capacity of Any Furnace From 100-200%

SENSITIVE CIRCULATION POSITIVE

Circulates Continuously 1500 Cu. Ft. of Air Per Minute

Delivered Upstairs and Down Through Every Register

ANNOUNCEMENT

JANUARY 1st will see this company one of the largest, if not the largest, of its kind in the world. At this time, our new plant, having four stories and approximately 130,000 sq. ft. of floor space, will become the home of The W. E. Lamneck Company.

Our constant growth over a period of 25 years, to our present magnitude, we feel, is due to our policy of placing quality before quantity—always, and of co-operating to the fullest measure with dealer and jobber upon whom we consider our success dependent.

It is our intention to continue production evenly throughout the year, making use of our immense storage capacity when necessary. This will permit us, as in the past, to care for our customers at all times, regardless of the increased volume of business we trust it will be our good fortune, as well as yours, to do in 1923.

Everything for the Sheet Metal Worker and Furnace Man

The W. E. LAMNECK Co.
COLUMBUS, OHIO

HONEYWELL FURNACESTAT

You can make big sales and profits with this

New, Practical, Automatic Air Circulator

EVERY home owner in your territory who has a furnace heated house, and every man for whom you install a furnace is a live prospect.

Every furnace owner uses a large percentage of his coal supply every winter *simply to create proper air circulation.* This is true regardless of the make of furnace or the exactness of installation. The reason for this is that the operation of gravity is nearly always obstructed for some of the various reasons which you of course understand. This makes it necessary to fire more, to produce more heat than necessary simply to force the heat through the stacks.

Honeywell Temperature Regulators

A most improved and complete high grade line of temperature regulating instruments.

Gravity Motor, Spring Motor and Electric Motor Models. *Write for general catalog now.*

The HONEYWELL FURNACESTAT forces the air—gives proper circulation—saves fuel

HERE'S what it is—it consists of two devices, as illustrated on this page, the Honeywell Furnacestat and Aerofan. These two devices working in combination "boost" the warm air up the furnace pipes making forced and overhot fires unnecessary. It does not drive the air with great force but gently and insistently pushes it along by means of an economically operated and wonderfully efficient two speed silent fan.

The Aerofan is ready day and night under control of the Honeywell Furnacestat.

It starts and stops instantly at the bidding of the Honeywell Furnacestat.

The Furnacestat is installed, as shown, with the sensitive part projecting through the casing into the warm air chamber. There's a snap switch in the head of this device which connects to the fan. That's all there is to it—the changing of the temperature automatically starts or stops it as needed.

There is also a switch in the fan circuit connected with the chain that opens and closes the draft damper. When the draft is opened the fan starts and vice versa.

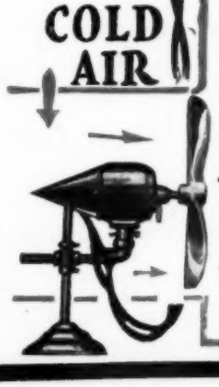
Notice that the fan is so designed that it does not interfere with the natural circulation of air. Everything about this Honeywell equipment is of the best and practical in every respect. It can be used to advantage in connection with room temperature regulators of any type.

Start Selling and Installing the HONEYWELL FURNACESTAT—Now

YOU know that the warm air ought to be pushed up—you know that this will save a great amount of fuel, quicken the circulation and time of heating, lower the furnace temperature, make the basement cooler, lengthen the life of the furnace and help to heat all rooms evenly.

And you wont have much trouble convincing your customers—especially as the price is reasonable and the operating cost when running is less than the expense of burning an ordinary electric lamp.

Write today for our prices—let us show you the profit for you—catalogs, circulars and full information sent on request.



FAN

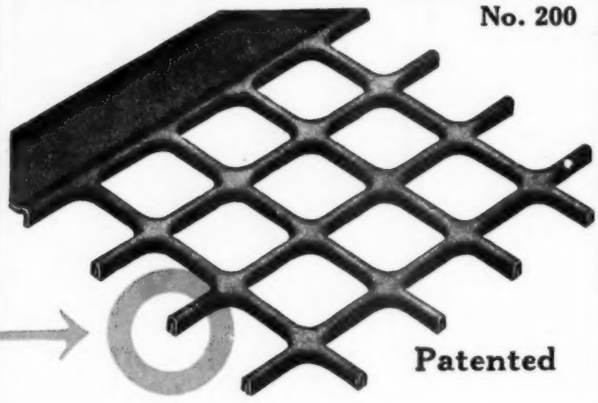
HONEYWELL HEATING SPECIALTIES COMPANY
WABASH - - INDIANA

You Make Bigger Profits with these

Because—

The H & C
Patented
PINCHED-UP-FRETWORK
Floor Registers

No. 200



Patented

THESE registers have revolutionized sizes formerly used for standard pipe sizes. A great saving in the cost of registers is assured on every job, if the correct size of H & C Registers is used.

The air capacity of our registers is not guesswork or assumed. We give you the actual figures and they will show increased air capacity averaging 25%. This same saving is effective in our cold air faces.

They give you Greatly Increased Free Air Space

The H & C
VERTICAL BAR
Baseboard Registers

No. 170

Patent Applied for

Write today for Folder "S"

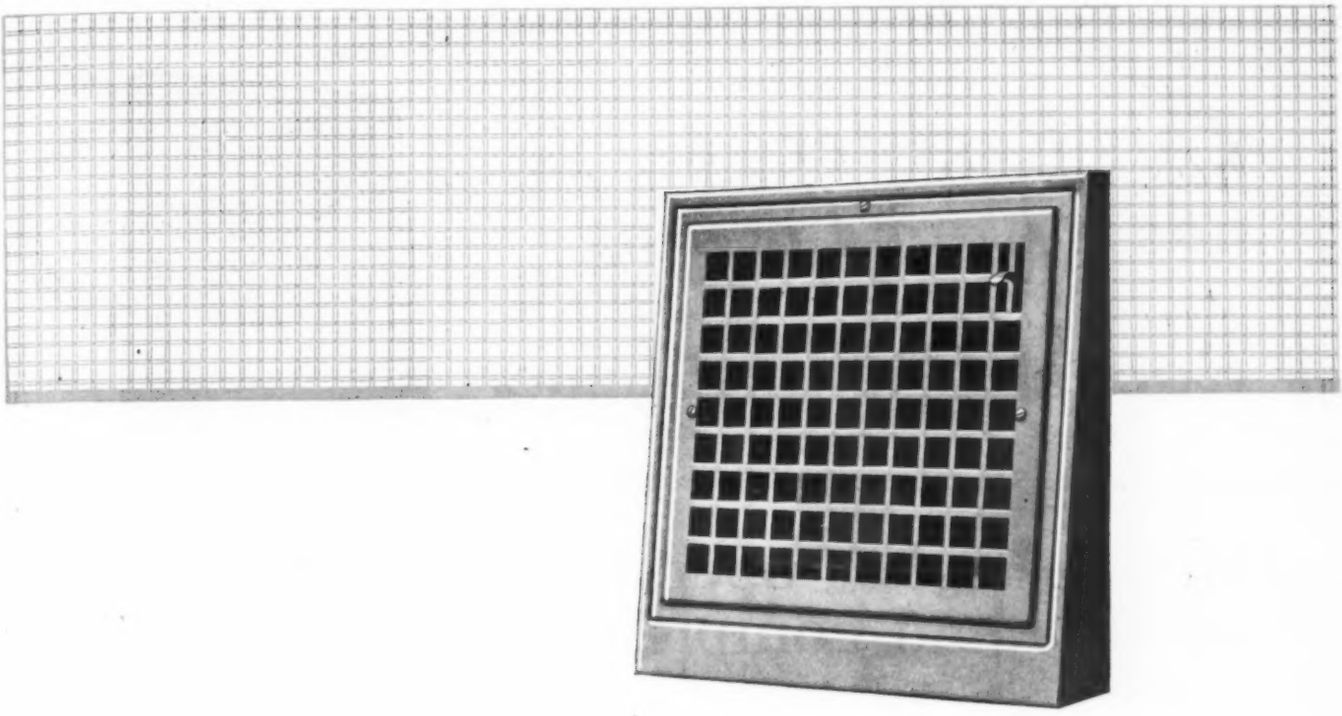
The HART & COOLEY CO., Inc.

Designers and Manufacturers of H & C Wrought Steel Products of Quality

New Britain, Conn.

73 East Lake St., Chicago, Ill. **501-5th Ave., New York City**

Real Estate Trust Bldg., Philadelphia



TANBO

The New Patent Protected Finish for Registers

IT took you and me 21 years to grow up to be men. But it took the Tanbo Finish *four years more* before it had its long pants on.

Think of it, a quarter of a century in the making!

But hold on, it takes three months to grow a *pumpkin,* and about a century to grow much of an *oak.*

Karl Tanbo had an idea for a new finish a quarter of a century ago.

Ever since then we have been working to perfect it.

But even when we finally made the discovery that finally made Tanbo Finishes possible, we yet had to give it the severest kind of wear-and-tear-tests to prove it was thoroughly practical.

When it *withstood them all,* then and *not till then,* did we tell you a word about it.

In Brass and Oxidized Copper effects, it looks like a regular Tiffany finish.

In oak, mahogany or walnut, you simply can't tell it from the real thing.

Tanbo Finish is patent protected. No other makers of registers can use it.

After you see the finish itself, you'll open your eyes good and wide, when we tell you how little it costs.

Send for our circular about this Tanbo Finish. Get the price.

Jas Bee

TUTTLE & BAILEY MFG CO.

Established 1846

BOSTON
36 Portland St.

NEW YORK
2 West 45th St.

CHICAGO
1123-29 West 37th St.

This Register has a Cam Locking and Rachet Opening Lever

This *springless* operation means longer life and complete satisfaction

CONTINUAL change of temperature and constant use take the "spring" and life from any spring and the result is a register that fails to work.

The Stearns Steel Register has an entirely new and exclusive operating device—notice this valuable Stearns feature from the illustration above.

This is the only operating device which makes a register stay open and absolutely locks it tight and leak proof.

Nothing to wear out or become weak—it will last a lifetime.

Stearns Registers are made of strong, tough steel — every one guaranteed against breakage.

Use Stearns Steel Registers next time and notice the quality and finish they put to the job.

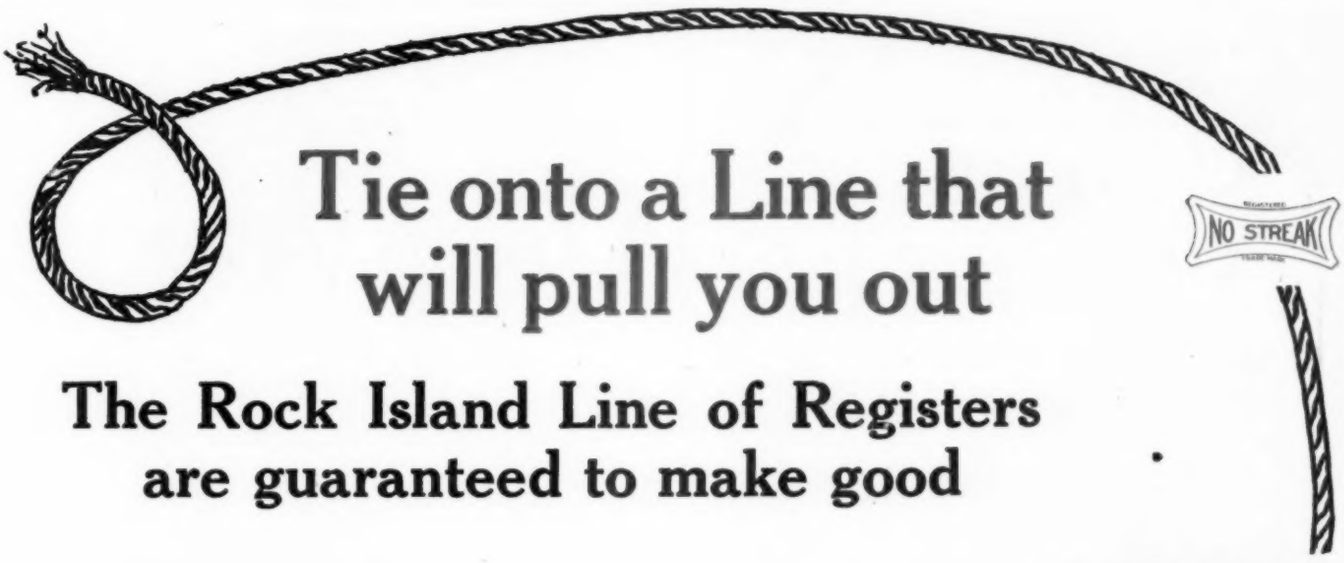
Stearns Register Company
617 East Fort St. Detroit, Michigan

STEARNS NEW GRILLES

Write today for details on our new and complete line of grilles.

Your name and address on the back of a post card addressed to us will bring you complete catalog and price list at once.

Specify STEARNS STEEL REGISTERS



Tie onto a Line that will pull you out

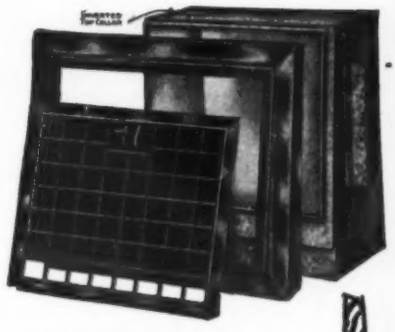
NO STREAK

The Rock Island Line of Registers are guaranteed to make good

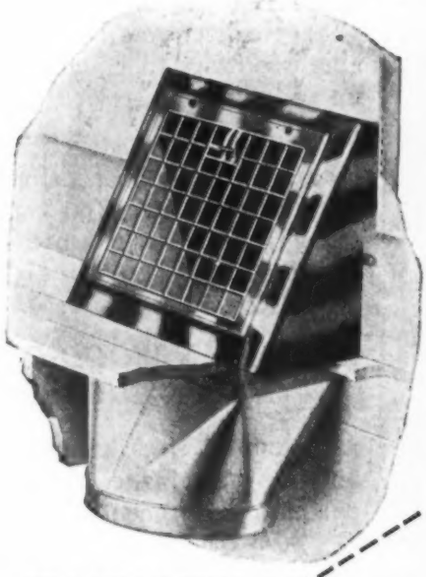
NO STREAK REGISTERS will satisfy your most exacting customers and bring recommendations from their Service.

THE OUT-O-WALL Register meets that long standing demand for Quick and Profitable installations in Old House work.

THE ISLAND CITY REGISTER covers all requirements for a first class, reasonable price register without box.



ROCK ISLAND
NO STREAK



But this is only part of the story.

Get our Catalog and 1923 prices at once.

ROCK ISLAND REGISTER CO.

ROCK ISLAND
ILLINOIS

THE OUT-O-WALL REGISTER

ROCK ISLAND REGISTER COMPANY

SEND THIS COUPON TODAY

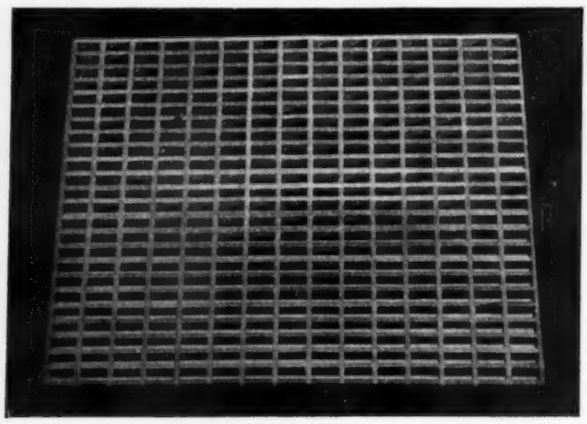
Send catalog and prices to

Name.....

Address.....

A A

AMERICAN WOOD REGISTERS



Our Quality is the Standard

WHEN you use an American Wood Register you use a strong, dependable wood face that you know will stand up and give the service expected of it.

Every detail of construction is inspected by a master workman before we allow it to go out to you. You can be sure of strength, the best of wood and superior workmanship when you order American Wood Registers.

AMERICAN WOOD REGISTERS NEVER DISAPPOINT

All standard sizes are carried in stock, and we can make prompt express or parcel post shipments.

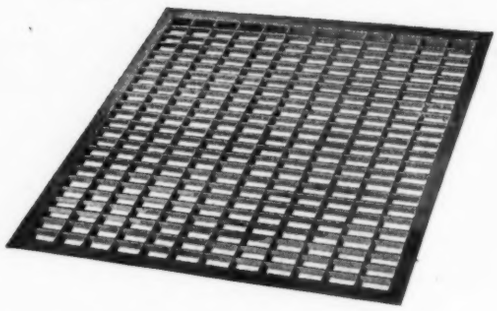
Next time use AMERICAN WOOD REGISTERS and notice the high quality.

Get our prices now

THE AMERICAN WOOD REGISTER CO.

PLYMOUTH, IND.

82% Open Area



Independent "Fabrikated" *Register Faces*

Pipeless Furnace Gratings

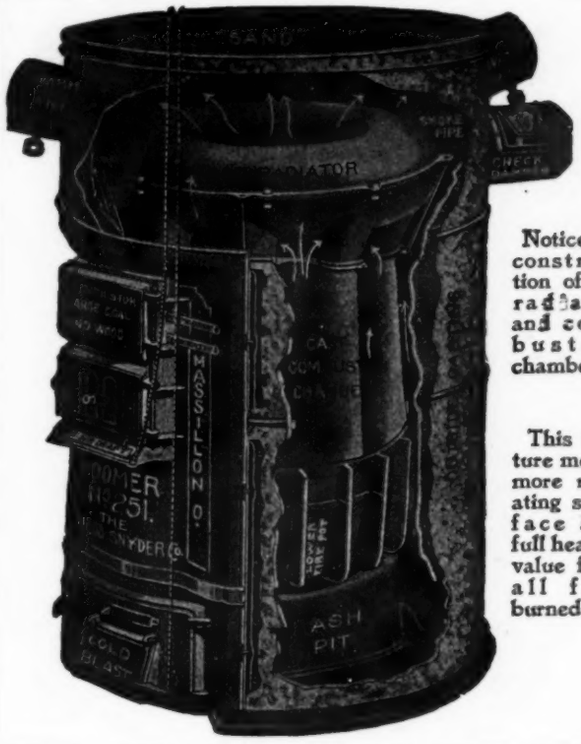
THE outer frame is angle iron, the interior grill of strip steel.

EXTRA STRONG AND RIGID

Why buy a larger size when a smaller one gives the same open area—at a lower cost?

Make us prove it.

INDEPENDENT REGISTER & MFG. CO.
415 Perry Payne Building
Cleveland, Ohio



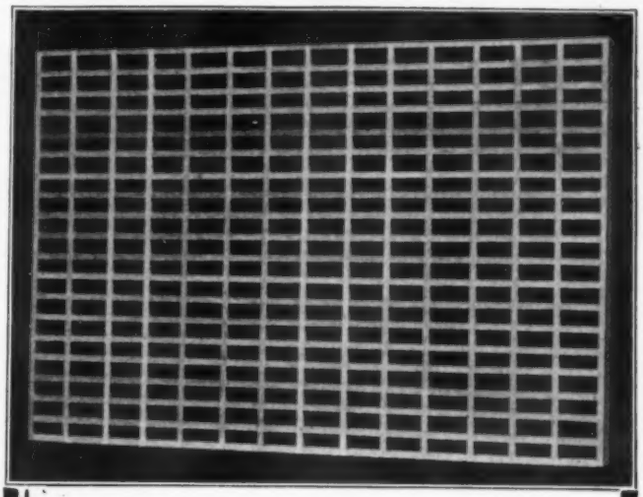
Notice the construction of the radiator and combustion chamber.

This feature means more radiating surface and full heating value from all fuel burned.

BOOMER

furnaces have been successfully made and sold for over 36 years. They have other good features that help dealers make sales. BOOMER DEALERS get real co-operation from us. ***Write today for our latest catalog and let us tell you all about it.***

THE HESS-SNYDER COMPANY Massillon, Ohio



A job worth doing is worth having—

HIGH GRADE *Eaglesfield* **WOOD FACES**

EVERY Eaglesfield Wood Face is a finished piece of work—made of high grade quartered white oak, *thoroughly* kiln-dried.

Your customers will appreciate the sturdiness of Eaglesfield Wood Faces—each cross piece is—

7-16 inch deep

This is 1-8 inch deeper than those used in ordinary faces and we use the highest test Hide flake joint glue and secure each end piece with a nail in each and every stringer.

Every Eaglesfield Wood Face

is finished by hand on sanding machine—

and we thoroughly inspect each face before it leaves the factory.

Eaglesfield Wood Faces are the kind you and your customers would expect and be willing to pay more for—but they are economical.

Tell us to send our catalog and price list today

EAGLESFIELD VENTILATOR CO.

"Sudden Shippers"

916 Dorman St. INDIANAPOLIS, IND.

WIECHERT
BELLEVILLE ILLINOIS

RED FRONT FURNACES

EVERY dealer knows that some furnaces are better than others—you know that the quality rests in design, construction, weight, and material used. Red Front Furnaces are extra high grade furnaces—we list below a few of reason why—have us give you our Quantity Price on this Quality Productr.

Write today for full details.

Large heating surface Radiator.

Heavily corrugated combustion chamber gives double heating surface.

Fire Pot is smooth inside and ribbed outside. In two parts and extra heavy.

All castings made of best Grey Iron.

Full cast front.

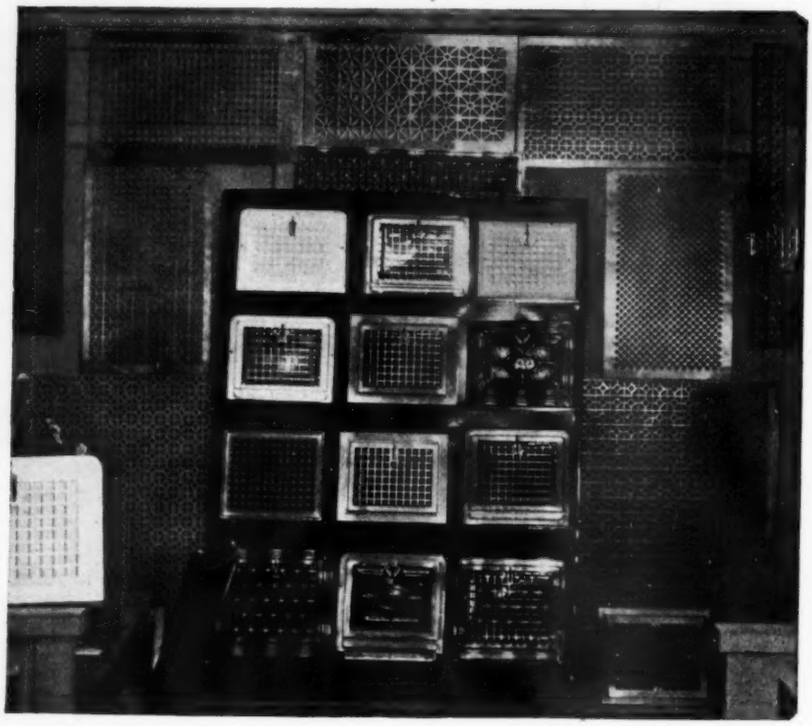
Deep cup joints and every heater is perfectly fitted and mounted at our foundry before shipped.

Extra large water pan.

Triangular Grates—Shaker opening is covered with small door.

Red Front Furnace & Supply Co.
149 W. Austin Ave., Chicago, Ill.

Some of the AUER Line

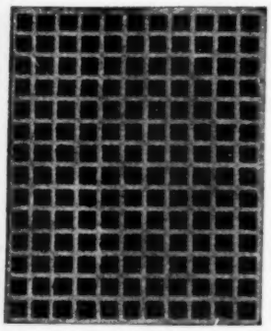


Manufactured by

THE AUER REGISTER COMPANY

Cleveland, Ohio

"Pagett" Wood Register Ventilators



No. 7

YOU'VE seen lots of Wooden Cold Air Faces, Ventilators and Registers, but until you've used the "Pagett" brand you haven't used the kind you want.

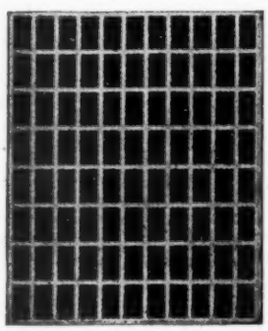
We illustrate our No. 7 Square Mesh and No. 10 Oblong Mesh, the strongest, best constructed on the market. The wood is the best and without flaws of any kind.

You can get "Pagett" in any Size, Style or Shape, and in any finish to match the woodwork. For under hall seats, under stairs, in walls, in floors, etc. Special or odd sizes and finishes also.

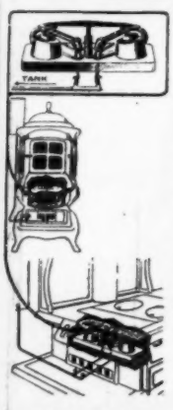
If you want highest quality, finest workmanship at the right price order "Pagett" Wood Faces.

Write today for our circulars and attractive prices.

McCLURE BUILDERS' SUPPLY COMPANY
EAST PALESTINE, OHIO



No. 10



BEST-HEET OIL BURNER

For Heating—Cooking—Baking

A RELIABLE, GUARANTEED Burner that is the simplest ever devised. Is free from complications; does not form carbon in the generating pipe or require accessory primer. Can be adjusted to the draught conditions and installed in 20 minutes without altering any stove. Installation is made with only a pair of pliers because the **BEST-HEET** has but six main parts in the complete outfit—tank, tubing (3 pieces) valve and burner. The burner is cast iron.

BEST-HEET OIL BURNERS ARE SOLD ONLY THROUGH DEALERS. List price $17.65. We want responsible heating merchants in every town to sell these burners. Attractive discounts offered to merchants assures splendid volume of profits, limited only by the number of stove users.

There are more desirable features that the important heater man in every community should know. Our latest circular describes in full, write for it today.

BEST-HEET OIL BURNER CO., 508 W. Van Buren St., Chicago, Ill.

BORN—Dec. 21st, 1922, to the **WISE FURNACE CO., Akron, Ohio**—a robust healthy infant for heating homes. This baby will make the old timers hustle to keep up, for the only thing small about him is the price. Write for detail description of new resale plan that will increase your volume and profit, and reduce your cost of doing business.

I sell complete lines of Fittings, Registers, Accessories and Stoves.

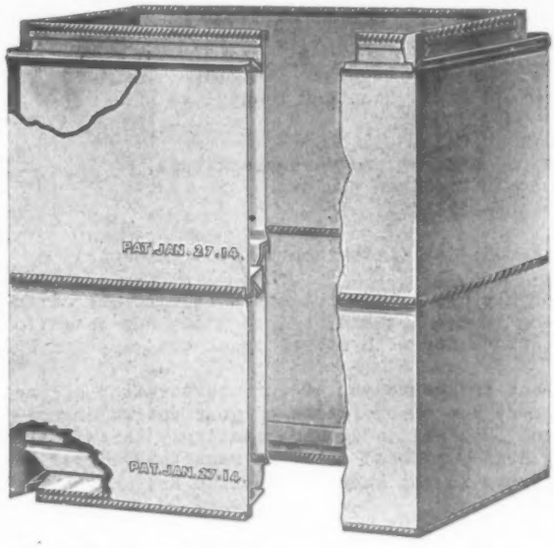
H. B. Huffaker, Mfgrs. Agt., Council Bluffs, Ia.
1020—7 AVE.

"More Heat for Less Money"

EXCELSIOR SELF-LOCKING DOUBLE WALL PIPE

(Patented 1-27-14—Improved for 1923)

IS from 5 to 8% more efficient than any other and saves its entire cost in a single winter



COSTS less installed than any other pipe owing to its patented self-locking construction.

Catalog and prices on request to

THE EXCELSIOR STEEL FURNACE CO.

114 to 118 So. Clinton St. **Chicago, Illinois**

This shows Regulator in operation with **Both** the check and draft closed at the **same time.**

Here is the Latest Thing in HEAT REGULATORS

An improved regulator that absolutely regulates. It is the only regulator on the market that operates the dampers independent of each other.

The Improved MASTER Heat Regulator

keeps the temperature more even and positively saves more coal than anything yet placed on the market.

Get Full Information, Prices and Circulars now. It will make money for you.

HUNTER HARDWARE CO.

ROCKFORD, ILLINOIS

Make easy profits---

Every customer on your list is a *buyer*

STEEL WIRE

FURNACE BRUSHES

There isn't a man in your territory who wouldn't welcome a furnace brush like this.

It's something every man wants—and dealers find that just by putting some in the window they move their stock quickly.

The brush is 4" all Wire and the handle is 4 ft. flexible wire. It can be used on any furnace, Steam or Hot Water Boiler.

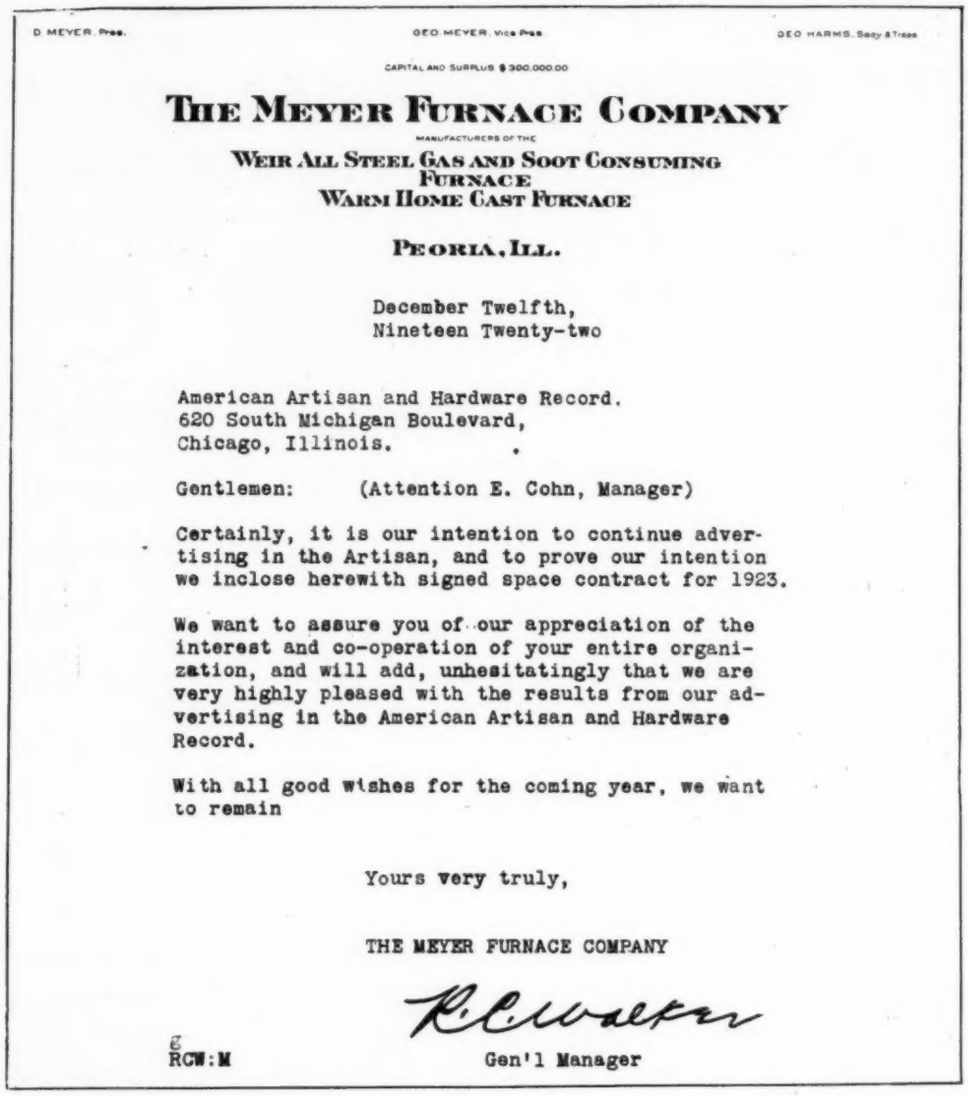
Every man who fires a heating plant knows that a clean furnace or boiler means more heat and less fuel.

A Big Seller---Good Profits

Order a stock—put some in your window and start making easy sales NOW. Write today for Prices

HARDWARE SPECIALTY CO.

BOX 446 - - FORT WAYNE, IND.



D. MEYER, Pres. GEO. MEYER, Vice Pres. GEO. HARMS, Secy & Treas.

CAPITAL AND SURPLUS $300,000.00

THE MEYER FURNACE COMPANY

MANUFACTURERS OF THE

WEIR ALL STEEL GAS AND SOOT CONSUMING FURNACE
WARM HOME CAST FURNACE

PEORIA, ILL.

December Twelfth,
Nineteen Twenty-two

American Artisan and Hardware Record.
620 South Michigan Boulevard,
Chicago, Illinois.

Gentlemen: (Attention E. Cohn, Manager)

Certainly, it is our intention to continue advertising in the Artisan, and to prove our intention we inclose herewith signed space contract for 1923.

We want to assure you of our appreciation of the interest and co-operation of your entire organization, and will add, unhesitatingly that we are very highly pleased with the results from our advertising in the American Artisan and Hardware Record.

With all good wishes for the coming year, we want to remain

Yours very truly,

THE MEYER FURNACE COMPANY

R. C. Walker

RCW:M Gen'l Manager

THE Meyer Furnace Company says it pays them to use large space in

AMERICAN ARTISAN
AND
HARDWARE RECORD

throughout the entire year and the letter above shows that they are ready for 1923.

If adequate and consistent advertising in our pages pays them it will pay you.

Let one of our representatives confer with you regarding your advertising—let us help you make up a schedule *now*.

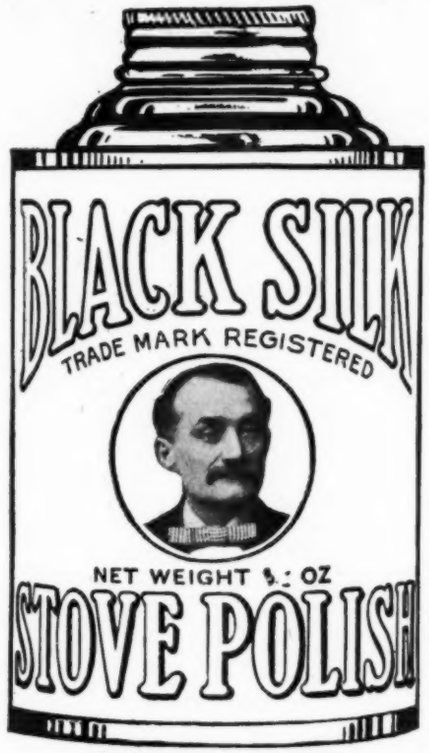
Our advertising department will prepare and submit copy for your approval if you desire, without extra charge.

We are ready to help you map out a constructive, result getting advertising program for 1923—make us prove it.

AMERICAN ARTISAN AND HARDWARE RECORD

620 S. Michigan Avenue **Chicago, Illinois**

"A Shine in Every Drop"



No Dust

Shine Stays

Liquid and paste, one quality.
5 lb. cans for dealers' use; domestic packages to retail. Buy through your jobber.
Black Silk Stove Polish Works, - - Sterling, Illinois

THE PARKER UN-X-LD QUADRANT

has been adopted, in preference to others, on account of the simplicity of its construction and other distinctive features.

Send for circular or sample

The Quadrant is quickly and easily installed to the duct. Can be used on flat as well as round surfaces.

The damper is locked in the desired position by tightening the wing nut. The graduated rib which acts as a brace, also shows exact position of the damper at a glance.

Your jobber carries them.

PARKER SUPPLY CO.
DEPT. A A NEW YORK
Branches: Chicago, Philadelphia, Springfield, Minneapolis.

STOVE BOLTS

WE are large producers of a first quality and are in position to make prompt shipments.

STOVE RODS

We are equipped to manufacture Special Bolts, Rods, Pins, Nuts and Rivets of every description.

STOVE RIVETS

Catalog and Prices upon application

THE KIRK-LATTY MFG. CO.
CLEVELAND, OHIO

Read the Wants and Sales Pages

The Pointer Specialized Range

WE have closed the biggest year we ever had.

Not only did our sales show a big increase but hundreds of new dealers are on our books.

This interests you only because it shows that our dealers who have been specializing with us in selling the Pointer Specialized Range have had *good* business.

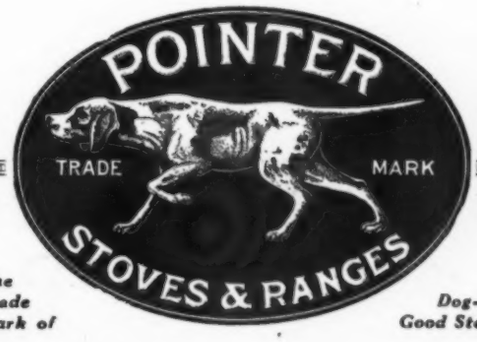
We make just this one size and style of range—our production costs are therefore lower—our workers more efficient and our output per day greater.

This enables us to use the best material, make Pointer Ranges extra high grade and yet pass a good portion of our saving on to you.

Start the new year as a Pointer dealer.

Let us point out to you our low prices and attractive dealer proposition. Write today.

GOHMANN BROTHERS AND KAHLER
New Albany, Indiana



The Trade Mark of A Dog-on Good Stove

SUCCESSFUL HEATING

SERVICE HEATER

SUCCESS HEATER & MFG. CO.

The Emblem of Quality

EVERY Success Heater is built and sold with the realization that the good will of satisfied users is more essential to a substantial future than the temporary big profits of skimpy construction.

Success Heaters have made good all over the country. They have brought the comfort of Health Heat to thousands of homes. If you want to sell a quality line, we want you as our dealer.

SUCCESS HEATER & MFG. CO.
— Des Moines —

Founded 1880 by Daniel Stern

Thoroughly Covers the Hardware, Stove, Sheet Metal, and WarmAirHeatingand Ventilating Interests

AMERICAN ARTISAN and Hardware Record

Address all communications and remittances to AMERICAN ARTISAN AND HARDWARE RECORD 620 South Michigan Avenue CHICAGO, ILLINOIS

PUBLISHED EVERY SATURDAY BY THE ESTATE OF DANIEL STERN

Eastern Representatives: C. C. Blodgett and W. C. White, 1478 Broadway, New York City

Yearly Subscription Price: United States $2.00: Canada $3.00: Foreign $4.00

Entered as Second-Class Matter June 25, 1885, at the Post Office at Chicago, Illinois, under Act of March 3rd, 1879

Copyright, 1922, by the Estate of Daniel Stern

VOL. 84. No. 27. CHICAGO, DECEMBER 30, 1922. $2.00 Per Year

WARM AIR HEATING INDUSTRY IS ON WAY TO REAL PROSPERITY.

The Warm Air Heating Industry showed progress during 1922. While the total sales may not equal those of other years, and while profits may not prove to be more than a mere shadow of what they ought to be—still it can be stated truthfully that considerable progress was made.

In the first place—a real start toward standardized rules for installation work has been made through the approval by the three most important organizations in the industry, representing manufacturers, wholesalers and installers, of the Standard Code for Installation of Warm Air Furnaces in Residences.

The Code is not perfect, but in it are set down a number of definite rules, about which there is little or no dispute, and experience will tend to demonstrate that the matters which are still in dispute can be settled in a manner satisfactory to all, so that "good installation practice" may really mean something more than a mere rule of thumb and be based on scientifically worked out formulas, proven true in actual work.

In the second place—more and more manufacturers are coming to a realization that a warm air furnace is something more than a lot of cast iron or sheet steel, and that it must be made and sold on something else than a tonnage basis. It is true, of course, that the manufacturers must take value into consideration and that "tonnage" in this sense is of importance, but more and more manufacturers are coming to realize that the finish and the efficiency of their furnaces are really the two points that make for steady growth and lasting trade.

In the third place—installations, the most important factor, are actually being planned with more care and executed in more efficient manner, due at least in some measure to the many instructive articles on this subject which have been published by American Artisan but also to the co-operation furnished by the engineering departments of many of the manufacturers.

We mention simply incidentally, because it belongs here, that during 1922 American Artisan has published more articles and reproduced more plans bearing on installation work than all the other trade papers in this field put together.

It is also a matter of record that in our advertising section we have a larger number of manufacturers of warm air furnaces and supplies represented than any other trade journal, and that in this, our 1922 Warm Air Furnace Special, we have broken all records for advertising patronage and space in this field.

For 1923 we predict still greater progress and prosperity for the manufacturer and the installer, provided, of course, that each one in his field follows the accepted rules of good work and goes after business in a really determined manner with a well planned selling campaign.

1922 WAS BETTER THAN EXPECTED AND 1923 WILL BE STILL BETTER.

To the ultraconservative, 1922 was a disappointment—as it was to the ultraoptimist.

The year which has just come to a close proved better, so far as "business" is concerned than many expected and not so good as some hoped.

Taken as a whole, however, we believe that 1922 will go down in history as a year of great achievement, if for no other reason than the fact that we have gotten down to a basis which promises to be fairly well established for some time to come, so far as values are concerned.

Prices have been reduced to a point where, if any change is to come, they will be higher—generally speaking, of course.

Business during the past six months of 1922 was very good for some manufacturers, especially those who had prepared themselves to fill orders quickly, by making up reasonable quantities for stock.

It was not so good for those who had to go out and buy in the primary markets. Deliveries were difficult to secure and premiums had to be paid to obtain certain material, all of which reduced profits for this class.

It was the same with the retailers:

Those who were foresighted enough and who had courage to place orders last spring had the goods when the consumer began to buy.

Those who kept on looking for a further slump in prices found it necessary in most cases to pay more than it would have been possible to secure merchandise for when the traveling salesmen were urging them to buy.

But what of 1923?

Here is what Edward E. Gore, the retiring president of the Chicago Association of Commerce, probably the greatest body of men interested in promoting the commercial interests of any one community says:

"There is no question of the next twelve months' business being better than any similar period during the last three years. Demands for new construction of buildings for all purposes insure employment for every class of labor. The wide range of materials entering into modern construction, together with profitable employment for nearly every type of worker, would produce prosperity without consideration of any other factor.

"The situation of the farmer is bound to improve markedly during the coming year. Already there has been a decided improvement in the purchasing power of the agricultural districts: it has been noticeable for two or three months. Farm machinery houses have not yet felt the impetus of this revival because the season is not right, but I look for a decided improvement in their business in the early spring months. Farmers have gone so long without buying new machinery that they will be compelled to make purchases during the coming year. This will release the piled-up stocks of farm implements and lead to further business activity."

When it is considered that Mr. Gore is not engaged in selling merchandise but in the business of "public accounting," and that, therefore, by his very experience and training must be a conservative, his statements are just so much more significant and encouraging to the man who at this time must decide on his purchases and expenditures for 1923.

* * *

To its great family of interested subscribers and advertisers American Artisan and Hardware Record bespeaks a Happy New Year and extends its sincerest well wishes for the coming year.

May this time and occasion serve to remind us all that there is a community of interest between manufacturer, artisan and retailer and that this publication endeavors to serve as the medium through which that bond of interest may most efficiently be expressed.

We are proud to point to the achievements of the past year, as reviewed in these pages, and turn to the new year with best wishes to all—secure in the thought that earnest purpose and high endeavor will earn their just reward.

Random Notes and Sketches.

By Sidney Arnold

"It is a fine thing to have good principles," says E. B. Langenberg of the Front Rank furnace folks, "but having good principles are not enough," and then he proceeds to tell the following story:

Pat was a good husband and a good father and had taken good care of his family at times. He was well liked in his neighborhood, but occasionally he would go on a spree while his large family got along as best they could. When his unexpected death came the neighbors were shocked, and a kindly woman, chatting over the fence with Pat's wife, proceeded to comfort her by telling of Pat's good points.

"He was such a man of principle," said the neighbor.

"And am I not the one to know it?" replied the bereaved wife. "Sure and every Saturday night from the first day we were married didn't he come home and place his pay envelope in front of me as regular as a clock? Not a night did he miss all the time we were married. Of course the pay envelope was always empty, but look at the principle of the thing!"

* * *

Anent the announcement of the engagement of Bill Laffin, the Tee Bee register man and tramp comedian at sheet metal conventions, the following might not be considered out of place:

He was a headline writer for a daily newspaper. She was the daughter of a prosperous bootlegger. They sat on the beach and watched the moonlight ripple on the ocean. After a silence he spoke.

"Scribe Woos Hooch King's Daughter. Meets Fate at Seashore."

"Oh, Tom," she murmured faintly, "when did you first know you really cared?"

"Journalist Smitten at Net Tilt. Loses Heart as Heiress Wins Tourney," he answered.

"And am I the only girl you ever loved?" she asked.

"Rum Magnate's Daughter Downs Rivals," he replied. "Pops Question on Beach."

"Tom," she breathed softly.

He clasped her tenderly in his arms and whispered in her ear: "Beach Parley Huge Success, Says Scribe."

* * *

About twenty years ago one of my friends who had bought a new house invited me to come in and look it over.

Cartoon by Gaar Williams, Showing Early Type of Heat Regulator.

This was in the days before anyone had ever heard of Volstead and his one-half of one per cent, so when this friend asked me to step down into his basement I had no idea as to what he wanted to show me.

But I saw something new—a home made heat regulator operated by an alarm clock. The contrivance looked very much like the "Thingamajig" that Gaar Williams drew recently in the cartoon, shown herewith, for the *Chicago Tribune*.

The point which appealed to me especially was the fact my friend did not have to get up at 5:30 in the morning to open the drafts in his furnace, and that by 6:30, when he got up to dress the house was warm.

Today, the heat regulator is considered a "regular" part of any properly installed warm air furnace, and none who have experienced the convenience and economy effected by this apparatus would any more think of dispensing with it than he would consider driving an automobile without a windshield.

"It is well to look before you leap," says Roy Walker, of the Meyer Furnace Company, "but there are few men as fore-sighted as the man mentioned in the following conversation:

The Boss: "We need a far-sighted man for that job, you know. Do

you really think Jones is that sort?"

His Partner: "Well, he and I belong to the same church and I've attended more than a dozen Sunday school picnics with him and he's never forgotten his umbrella."

The Boss: "He'll do."

* * *

Dick Wiechert, of the St. Clair Foundry Corporation, tells a story about a dear old lady who was having her first ride in a taxi:

She watched with growing alarm the driver continually putting his hand outside the car as a signal to the following traffic. At last she became exasperated.

"Young man," she said, "you look after that car of yours and watch where you are going. I'll tell you when it starts raining!"

* * *

Dick Moncrief, who attends conventions for the Henry Furnace & Foundry Company, sometimes has to travel on the "one-engine" railroads of Ohio which somehow manage to stay alive on purely local traffic.

For a couple of hours the rural railroad train had been bumping along, stopping mysteriously every now and then and making the hardest kind of going. Finally there was a delay of almost an hour, after which the conductor walked through the smoker, casting furtive glances at the exasperated passengers. He at last selected Dick as the best-natured appearing man among them, leaned down and whispered:

"Say, have you got a piece of string? We want to fix the engine."

* * *

"If you do not believe in yourself, nobody else is likely to do so," said W. G. Wise, who makes the furnace with the owl trade mark, and then he told the following story which took place in the Akron court house:

A case involving some architectural plans was being tried and a number of nationally prominent architects were put on the stand as experts. Finally one William Sumner, a local architect of no particular reputation, was called. The plaintiff's attorney started to cross-examine him, demanding:

"Who do you consider the greatest architect in the world?"

"William Sumner," was the immediate reply.

There was a roar of laughter, in which the witness did not join. At the close of the trial one of his friends came up to him and asked:

"Didn't you go a little strong there, Bill?"

"Where—how?" queried Sumner.

"Settin' up there and claimin' to be the greatest architect in the world with all them big bugs around."

"Well, what else could I say?" asked the veracious Sumner. "I was under oath, wasn't I?"

* * *

Here is a new one on the Scotch and their reputed habits of frugality, which George Harms of Handy furnace pipe fame sends me:

A Scotch passenger on a liner was watching an approaching vessel through field glasses.

"Hoot!" he remarked to a companion. "She's a Scotch ship."

"How can you tell she's Scotch."

"Tak' the glasses yersel'. D'ye ken that there's nae gulls followin' her?"

PAGE 14
THE AMERICAN LEGION WEEKLY
Substitutes for Coal
By Wallgren
HOW TO KEEP WARM WITHOUT COAL.
IN VIEW OF THE THREATENED SHORTAGE OF COAL FOR HEATING PURPOSES THIS WINTER WE ADVISE THESE FEW EXCELLENT EXERCISES AS SUBSTITUTES.
SO, WHENEVER YOU FEEL REAL COLD AND UNCOMFORTABLE—
- THINK OF THE NICE COOL NAPOLEON BARRACKS IN FRANCE WHERE THE TEMPERATURE WAS NEVER ABOVE ZERO -
- OR THE CHILLY MID-WINTER WATCH ON THE HIGH SEAS.
- GO TO THE CLUB AND STAY LATE — THIS WILL INSURE YOU A VERY WARM RECEPTION WHEN YOU GET BACK.
- TRY BAWLING THE JANITOR OUT FOR NOT SENDING UP ENOUGH HEAT AND HIS ENSUING REMARKS FLOATING UP THRU THE SPEAKING TUBE WILL DO MUCH TO REDUCE THE FRIGIDITY
DUCK INTO A PUBLIC TELEPHONE BOOTH AND TRY TO GET A NUMBER IN A HURRY — BY THE TIME YOU COME OUT THE INTERIOR OF THE BOOTH WILL GREATLY RESEMBLE A TURKISH BATH.
WHY NOT UTILIZE THE HOUSE HOLD ELECTRICAL APPLIANCES?
- TRY SPLITTING KINDLING — AFTER A FEW CORDS OF THIS GENTLE EXERCISE YOU WONT NEED A FIRE TO WARM YOU -
EMULATE THE ESKIMOS - EAT PLENTY OF FOOD CONTAINING HEAT PRODUCING CALORIES.
BUY A USED CAR AND KEEP THE WHOLE FAMILY WARM — EVERY TIME YOU FEEL CHILLY TRY TO TAKE A RIDE.
WHEN THE TEMPERATURE IS REAL LOW JUST THINK OF THE SENATORS WHO HELPED KILL THE ADJUSTED COMPENSATION BILL. - TRY THIS AND YOU WILL GENERATE ENOUGH HEAT TO LAST YOU FOR HOURS AT A TIME. (DONT IT?)

Cartoon in American Legion Weekly Furnishing Suggestions for the Man Who Is Short of Coal.

Complete Text of Approved Standard Code for Installation of Warm Air Furnaces

This Code, as Approved by Chief Organizations of Manufacturers and Installers, Is Guide for Residence Installations.

AT THE request of many manufacturers and installers of warm air furnaces we publish again the complete text of the "Standard Code Regulating the Installation of Warm Air Furnaces in Residences."

Those who made the request did so because, as they said, AMERICAN ARTISAN Warm Air Furnace Specials, issued as they are at the close of each year, have come to be regarded as reference books for the coming year, so that the 1922 Warm Air Furnace Special should, they say, contain the complete text of the most important piece of information and instruction that was produced during 1922.

The Standard Code was prepared by a committee consisting of men with theoretical as well as practical experience in manufacturing and installing warm air furnaces. Their conclusions were arrived at after thorough discussion and investigation. Their recommendations were presented to the members of the National Warm Air Heating and Ventilating Association, the Western Warm Air Furnace & Supply Association and the National Association of Sheet Metal Contractors, the three chief bodies of manufacturers and installers, and were adopted as follows:

Outline.

Article 1.—Meaning of Terms.
Article 2.—Provisions in Building.
Section 1—Construction.
Section 2.—Chimneys.
Article 3.—Formulae.
Article 4.—Installation.
Section 1.—Location of Furnaces.
Section 2.—Foundation.
Section 3.—Setting Furnace.
Section 4.—Casings.
a. Portable.
b. Brick Set.
Section 5.—Basement Pipes.
Section 6.—Wall Stacks.
a. Single.
b. Double.
Section 7.—Registers.
Section 8.—Air Supply.
Section 9.—Smoke Pipe.
Section 10.—Pipeless.

Article Number 1.—Meaning of the Term "Warm Air Furnace Heating Plant."

Warm air furnace heating plants, to which this code refers, shall consist of one or more warm air furnaces, enclosed within casings, together with necessary appurtenances thereto, consisting of warm air pipes and fittings, cold air or recirculating pipes, boxes and fittings, smoke pipes and fittings, registers, borders and face plates, the same being intended for heating buildings in which they may be installed.

Article Number 2.—Provisions to Be Made in Building Under Construction for Reception of Warm Air Furnace Heating Plants.

Section 1. (a) The following provisions shall be made by the owner or building contractor, in any building wherein a warm air heating plant is to be installed.

(b) Where warm air register boxes, heads, pipes or stacks are to be installed, joists shall be set not less than sixteen inches (16″) on centers and shall be butted and not lapped. Studding shall set directly over and under joists, leaving a space of not less than fourteen inches (14″) between studs and joists. Wherever joists are cut, headers must be put in to support joists.

(c) All first story single or subfloors shall be continuous. In all houses having studded exterior walls, these floors shall be extended to the outside sheathing and all spaces between studding shall be closed at the attic line.

Note 1. *It is strongly recommended that the attic be tightly floored to reduce heat losses.*

(d) All partition walls (or sections of these walls) in which heat stacks to the second floor rooms are to be installed, shall be built of six inch (6″) studding to second story floor joists.

Chimneys.

Section 2. (a) The owner shall provide a chimney for the furnace constructed in a manner to comply with the following specifications.

(b) The chimney must be absolutely smoke tight throughout its entire length, and must extend at least three feet (3′) above a flat roof or two feet above the ridges of peak roofs.

(c) If built of a single thickness of brick or of cement blocks, it shall be lined throughout its entire length with fire clay flue lining, having not less than three-fourths inch (¾″) thickness. Flue lining to be laid in mortar and made airtight.

(d) The furnace flue must have no other opening for attaching any fireplace, furnace, stove, range, water heater, gas or ventilating connection.

(e) If necessary to offset the flue, it must be done in such a manner as not to reduce the cross sectional area nor create a ledge or obstruction, where loose material may lodge.

(f) Its narrowest dimension shall not be less than eight (8″) inches and no flue smaller than 8″ x 8″ rectangular or eight (8″) inch diameter round will be considered suitable when hard coal is to be burned, or 8″ x 12″ rectangular or ten (10″) inch round for soft coal or wood.

Note 2. *It is recommended that the height above the furnace grate be not less than twenty-six* (26′) *feet.*

Note 3. It is strongly recommended that all new chimneys be built in strict accordance with the ordinance recommended by the National Board of Fire Underwriters.

Article Number 3.—Method for Determining Size of Warm Air Pipes, Wall Stacks and Furnaces for Use in a Residence.

Method of Determining Size of Basement Warm Air Pipes.

(Read Explanatory Notes 4 to 11.)

Section 1. First Floor Rooms.

Divide square feet of glass by 12.

Divide square feet of net wall by 40.

Divide cubic contents by 800.

Add together the above and multiply by 8.

The result is the area of the basement pipe.

The sum of:

Glass (sq. ft.) (Note 4) ÷ 12, Net Wall (sq. ft.) (Note 5) ÷ 40, Cubic Contents ÷ 800 × 8 = Area of Basement Pipe (Note 10).

Section 2. Second Floor Rooms.

Divide square feet of glass by 12.

Divide square feet of net wall by 40.

Divide cubic contents by 800.

Add together the above and multiply by 6.

The result is the area of the basement pipe.

The sum of:

Glass (sq. ft.) (Note 4) ÷ 12, Net Wall (sq. ft.) (Note 5) ÷ 40, Cubic Contents ÷ 800 × 6 = Area of Basement Pipe (Note 10).

Section 3. Third Floor Rooms.

Divide square feet of glass by 12.

Divide square feet of net wall by 40.

Divide cubic contents by 800.

Add together the above and multiply by 5.

The result is the area of the basement pipe.

The sum of:

Glass (sq. ft.) (Note 4) ÷ 12, Net Wall (sq. ft.) (Note 5) ÷ 40, Cubic Contents ÷ 800 × 5 = Area of Basement Pipe (Note 10).

Method of Determining Size of Wall Stacks.

Section 4. First Floor Rooms.

Same as Section 1.

Section 5. Second Floor Rooms. Deduct 40% from basement pipe area determined in Section 2.

Section 6. Third Floor Rooms. Deduct 40% from basement pipe area determined in Section 3.

Explanatory Notes.

Note 4. In obtaining glass surface use full casement opening. An outside door is figured as glass.

Note 5. To obtain net outside wall multiply height by width and deduct the glass in all windows and outside doors.

Note 6. For rooms having unusual exposure, ordinarily north, northeast and northwest, add 15% to pipe area. For east and west exposure, add 10%.

Note 7. For cold ceilings, add one-half net area of ceiling to net exposed wall (cold ceilings are those next to unfloored attics).

Note 8. Use no warm air pipe less than 8 inches in diameter.

Note 9. It is understood in using the above values for determining basement warm air pipe areas, that these pipes should be run comparatively straight and that they should not be over 10 to 12 feet in length. Sharp turns and long pipes should have extra capacity.

Note 10. These formulae are for 70° inside temperature with zero temperature outside. For a temperature of 10° below zero, add 10% to the capacity of each pipe.

Note 11. The value of 800 (used in cubic contents) is for an estimated air change of one room volume per hour. If it is desired to provide for 1½ room volume use the figure 600. If for 2-room volumes use the figure 400. The factor of 8 in Section 1 will give a register temperature of approximately 190° in zero weather. Should a lower register temperature be desired, the factor 9 will give 175° at the register.

Transition Fittings and Stacks.

Section 7. Transition from warm air pipes to stacks shall be made with a well designed elbow or boot and no stack shall be less than 60% of the warm air pipe area.

Section 8. All registers shall have a free area at least equal to the calculated area of the basement pipe, transition fitting or stack to which it is connected.

Section 9. Add together the actual warm air pipe areas in sq. in. as obtained in Sec. 1, 2 and 3, and select a furnace having a free area not less than the sum of all the warm air pipe areas.

Article Number 4.—Installation and Location of Furnace.

Section 1. The location of the furnace shall equalize the length of warm air runs as far as possible, yet give necessary preference to pipes supplying living rooms, dining rooms and main halls.

Section 2. Furnace foundation of brick, cement, or other incombustible material must be provided. Said foundation to extend at least fifteen (15″) inches at rear and sides of furnace casing and at least thirty-six (36″) inches in front of furnace casing. Foundation to be level.

Setting or Assembling of Furnace.

Section 3. (a) The base ring of the furnace shall be cemented to the foundation, making an airtight joint. The furnace parts shall be assembled plumb and level, and in a workmanlike manner.

(b) All sections and joints shall be properly fitted. Joints requiring cement shall be well filled and all bolts shall be drawn up tightly.

Casings.

Section 4. (a) Warm air furnaces shall be enclosed in metal casings or walls of brick, tile or concrete.

(b) Portable. Sheet metal casings including casing tops shall be made of galvanized sheets, not lighter than Number 26-U. S. Standard Gauge. They shall fit the castings and casing rings closely, so as to be dust tight, and shall be securely fastened to the front. The casing shall be lined from the upper casing ring down to a line on a level with the grate.

(c) When side collars are used the casing top must be of sufficient height so that the largest warm air pipe can be taken from side without ovaling. In no case shall a distance

less than eight (8″) inches be maintained between the top of any furnace and the top of casing or bonnet.

(d) Any furnace, the casing top of which shall come within sixteen (16″) inches of a combustible floor, ceiling or joist, shall be protected by a metal shield, extending not less than eighteen (18″) inches beyond the casing of said furnace. This shield shall be suspended at least two inches below wood work, allowing free air space between shield and woodwork. No furnace casing or top, coming nearer than six (6″) inches of ceiling or joists shall be allowed in any case.

(e) Openings for side casing collars shall be cut into the casing top, so that the tops of all openings are on a level. Casing collars shall be fitted into place with a proper flange, or bead on the outside and drawn up on the inside, making a dust tight joint. All collars shall be of same size as the warm air pipes to which they are to be connected.

(f) Brick set, cement or hollow tile casings shall be constructed as follows: Walls shall be not less than eight (8″) inches in thickness, and shall be constructed airtight. Rectangular casing shall be, with least inside dimensions, the same as that of the portable casing of a corresponding size of furnace. Walls shall be carried to the same height as the portable walls, allowing not less than eight (8″) inches between the top of the furnace and the bottom of the top cover. After placing the collars for the warm air pipes, continue the masonry up even with the top of the collars, lay spacing rods of bar iron on edge or angle irons across the furnace top, cover these with sheet iron, cover the sheet iron with masonry and run the side walls four (4″) inches above the masonry bed. A galvanized iron casing bonnet may be used on brick set furnaces.

Provision shall be made in the walls for a manhole to give ingress to heater.

Warm Air Pipes in Basement.

Section 5. (a) All warm air pipes shall be made of bright tin not lighter than IC, or galvanized iron. Side seams shall be locked seams. All joints shall be either double seamed or lapped not less than one and one-quarter (1¼″) inches and such joints shall be beaded and soldered or riveted. All pipes shall be properly secured to ceiling or joist. No solder or riveted joint is required where round pipe slips over the casing collar. Any pipe twelve (12″) inches or greater in diameter shall not be made of material lighter than IX tin or Number 26 U. S. Standard Gauge galvanized iron.

Note 12. It is recommended that all warm air pipes in the basement shall have an upward pitch of not less than one (1″) inch per running foot.

(b) No warm air pipe shall run within one (1″) inch of any woodwork unless such woodwork is covered with asbestos paper and the paper covered with tin or iron.

(c) All warm air pipes in the basement shall be provided with dampers not more than two feet from the casing.

(d) Where warm air pipes pass through a masonry wall, a metal thimble shall be provided, having a diameter at least 1″ greater than the pipe, and pipe supported in such a manner that the air space is uniform on all sides.

Wall Stacks.

Section 6. (a) Single Stacks. All single wall stacks or wall pipes, heads, boots, ells, tees, angles and other connections shall be made of bright tin or galvanized iron and shall be covered with not less than one thickness of 12 lbs. per one hundred (100) square feet of asbestos paper. All studding and other woodwork facing said pipe shall be lined with metal and metal lath used in place of wood lath. An air space of not less than three-eighths (⅜″) of an inch shall be allowed on the two sides nearest the vertical studs. All such pipes shall be braced in a proper manner so as not to obstruct the flow of air but to retain the full capacity throughout. All joints shall be locked and held in place by means of lugs, or straps. No joint shall depend wholly upon solder to make it tight.

(b) Double Stacks. All double wall stacks or wall pipes, heads, boots, ells, tees, angles and other connections shall be made of bright tin, not lighter than IC or galvanized iron and shall be made double, from and including the boot or foot piece in basement to the top of each and every stack and register head on all floors. There shall be continuous uniform air space of not less than five-sixteenths (5/16″) of an inch, which must be maintained between the outer and inner walls of all such pipes and fittings of all kinds, styles and descriptions; such pipes, heads, boots and other fittings to be of the styles, or equal to those accepted by the National Board of Fire Underwriters.

All pipes and fittings either single or double must be secured firmly in place by lugs or straps attached to the outer walls of stacks and fittings, and no nails shall be driven through these stacks or fittings at any point. No wall pipes or fittings shall be used which depend wholly on soldered joints. The various members shall be so made that all joints are locked and soldered and the several members shall be attached to each other with slip joints, which are, for the purpose intended, airtight.

Registers.

Section 7. (a) When baseboard or wall registers are used, they shall be properly and permanently attached to the stack head in such a manner that will prevent any leakage of air between the head and the register.

(b) Floor registers shall be provided either with register borders or double register boxes of tin or galvanized iron with an air space of not less than five-sixteenths (5/16″) of an inch between inner and outer boxes.

(c) Registers for warm air and warm air pipes shall not be located in outside walls. The warm air registers in the various rooms shall be located in or near the inside walls in all cases.

Air Supply to Furnace.

Section 8. (a) The air supply to furnace for warm air heating

plants may be taken from outside or from within the building or may be taken partially from outside and partially from within. In no case, however, shall air be supplied to any furnace from any basement or furnace room.

(b) The cold air intake or return where air is taken from within the building shall have a net area throughout its entire length of not less than the combined net area of all warm air pipes leading from the furnace. This may be maintained in one or more ducts.

(c) When the cold air supply is taken wholly from the outside of the building the supply duct at its most contracted area must equal or exceed eighty (80%) per cent of the combined area of all warm air pipes leading from the furnace.

(d) Cold air ducts shall be constructed of metal, tile or other incombustible material having smooth inner surface and shall maintain a constant net area throughout their entire length and shall be made airtight. Where a boot or shoe is connected to the casing at the base, the opening shall not extend higher than a line on the level of the grate of the furnace. The width of the shoe shall be of proper measurement to make the area at least equal to that of the round or square pipe to which it is connected.

(e) Wherever the space between joists is used to convey cold air over head, the joists and all wooden surfaces between such joists shall be lined with metal and a sheet metal pan constructed to extend not less than six (6") inches below said joists. The connection from this pan to the boot or shoe shall be made of galvanized iron not lighter than Number 26 U. S. Standard Gauge, and shall have a transition collar, the top area of which shall be at least 10% greater than the area of the connecting pipe.

(d) The cold air face or faces shall be made of wood, or metal. When set in floors the top of same shall be flush with floor. Where cold air face is placed in a seat or side wall (whether furnished by owner, general contractor or furnace contractor) the open work of face must extend to within at least one (1") inch of the floor line.

The free area of cold air faces shall be at least 10% in excess of the free area of the duct or ducts to which they are connected.

Note 13. *The effective area of a vertical cold air face lies within twelve* (12") *inches of the floor line, hence, the capacity of any vertical cold air face shall be determined by multiplying the base line in inches by not to exceed twelve* (12") *inches in height and deducting for the grills or cross bars.*

Smoke Pipes.

Section 9. (a) The smoke pipe shall be as short and direct as consistent with the location of the furnace. It shall be made of either black or galvanized iron not lighter than Number 24 U. S. Standard Gauge, and of the full size of the collar on the furnace throughout its entire length. It must have no other opening for attaching any fireplace, stove, range, water heater, gas or ventilating connection. It shall be lock seamed or riveted; all joints shall lap not less than one and one-half (1½") inches and it shall be rigidly secured. Cast iron smoke pipe may be used.

(b) When the smoke pipe enters the flue, a thimble shall be cemented into the flue and the connections thereto made airtight. Should any smoke pipe come within sixteen (16") inches of any combustible material, such combustible material must be covered with asbestos paper and a metal shield so fastened that a two-inch air space exists between this shield and the combustible material. This shield shall be no less in size than twice the diameter of the smoke pipe and of sufficient length to cover the wood at all points.

(c) No smoke pipe shall project through any external wall or window.

Pipeless or One-Pipe Furnaces.

Section 10. (a) When but one duplex grating is used for both warm air and cold air in a so-called pipeless furnace, the area of the cold air intake shall be at least equal to the area of the warm air outlet of the grating. Article 4, Section 4, relative to casing shall not govern when this type of furnace is installed, but the following specification shall be followed: The inner and outer casing of this type of furnace may be made of either black or galvanized iron not lighter than Number 26 U. S. Standard Gauge. A uniform air space shall be maintained at all points between the inner and outer casing. In no case shall the top of the furnace be allowed closer than twelve (12") inches to any ceiling to joists above the furnace.

(b) Where joists are cut to accommodate this furnace, headers shall be put in and braced so as not to weaken the structure of the floor above the furnace.

(c) Article Number 3 for determining area of warm air pipe shall not govern in figuring a pipeless furnace.

(d) Where one warm air register face is used and separate face or faces for cold air supply are used, then Article Number 4, Sections 5 and 8 shall apply.

Manny Heating Supply Company Occupies Larger Quarters.

The Manny Heating Supply Company will on January 1st take over practically the entire building at 131 West Lake Street, Chicago.

The Boynton Furnace Company, one of the oldest furnace manufacturers in the country, who have occupied space in this building for many years, will on that date discontinue their Chicago branch.

Their stock will be turned over to the Manny Heating Supply Company, who will carry a full line of Boynton repairs for the benefit of the many thousands of Boynton users in the West.

The growth of the Manny Heating Supply Company, organized in the Spring of 1919, has been extraordinary. With this additional floor space, much larger offices which will be moved to the second floor, and increased office and warehouse help, Manny customers are assured of the same quick service.

1922 Prosperous, 1923 Better, Is Forecast for Furnace Industry of President I. L. Jones.

National Warm Air Heating and Ventilating Association Head Urges Better Costs System.

PREDICTING, before the books of 1922 have been balanced that it has been a prosperous year, and that the prospects for 1923 are brighter, I. L. Jones, president of the National Warm Air Heating and Ventilating Association, appeals, in the following article written specially for the "Warm Air Heater Special," for unanimous boosting of the installation code and for the study and use of better costs practices. The Association's special research work will go on, he says, and he foresees further accomplishments. He writes:

The year now drawing to a close should be a prosperous one for both the manufacturer and dealer. Starting slowly, the demand for furnaces has gathered momentum with the passing months and our facilities have been taxed to the utmost to supply the demand.

While agricultural conditions have caused the demand for pipeless and one-pipe heaters to lag, the call for other types have been very heavy.

It is especially pleasing to note the increasing use of the better grades of furnaces.

The great advance in the price of pig iron, coke and other materials entering into the cost of furnace manufacturing has naturally brought with it an increase in selling prices of furnaces. These selling prices, however, have not fully reflected the advance in costs. The dealers who bought early this year were fortunate, and no doubt have profited accordingly.

Never have the developments of the year's business better demonstrated the fallacy of loading up in the early part of the year with a lot of low priced business which hardly shows a profit, and which makes necessary the passing up of good profitable business when the real demand arrives. The consumer perhaps profits from this cut-throat competition, which so often develops in the spring months, but surely the manufacturers and dealers do not. No more furnaces are sold, but profits are materially reduced as a result of this condition. Nothing will so help this condition as a better knowledge of the costs of production and installation.

I. L. Jones

For the new year would it not be a good resolution to:

"Know our costs better than ever before?"

Our industry has made distinct progress during the year. The adoption of the Code for Installations, after the most careful consideration, marks a distinct step forward. Every effort is being made to secure a wide distribution of this code and many thousands of copies have already been distributed. It is to be hoped the coming year will see its adoption into the building codes of many communities. This will require concerted effort on the part of manufacturers and dealers, but the results to be obtained will justify the work necessary to secure its adoption.

The Furnace Research Work being carried on by the National Warm Air Heating and Ventilating Association at the University of Illinois with Professor Willard and his staff has progressed steadily under the direction of Professor Willard and the Research Committee of our Association. The difficulties encountered in the work and the way the problems have been solved demonstrate clearly the necessity and wisdom of co-operative effort in such an undertaking. Much has already been accomplished. The work is unbiased and accurate and as the work progresses, the facts developed will be far-reaching in their effect on design of apparatus and methods of installation.

The prospect is bright for a prosperous year ahead for the furnace industry. Let us all hope the prospect will be realized.

Increased Output, Adoption of Code, Were 1922 Milestones in the Warm Air Furnace Industry.

Allen W. Williams, Secretary of National Association, Reviews Events of Progress in Trade.

RESEARCH work carried on by the National Warm Air Heating and Ventilating Association at the University of Illinois, adoption of the new installation code, manufacture of a much greater number of heating units—these were the milestones for the year 1922 in the national warm air furnace industry.

In the selection of these outstanding features of the year's progress, there probably could be found no more competent authority to enumerate them than Allen W. Williams, secretary, National Warm Air Heating and Ventilating Association, and the author of the subjoined article.

Readers of AMERICAN ARTISAN AND HARDWARE RECORD will find in Mr. Williams' review of the year in the industry not only an analysis of

the principal events, but a most important suggestion for the future—namely, the adoption of better merchandising methods in display rooms. The article follows:

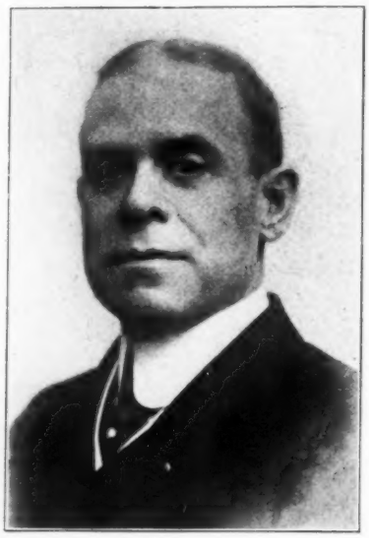
A Few Observations as to the Warm Air Furnace Industry.

The year that has just passed has been another one during which no amount of experience in the sales end of the business was helpful in determining production schedules; however, for the first few months this was unimportant as trade was light with prospects for business or profits uncertain. In addition to this in many cases unsettled labor conditions caused manufacturers to curtail the making of goods for stock. Nearly half of 1922 had passed before any marked improvement in business was noted but from July on the volume of orders assumed quite normal proportions, the city trade, as well known, being much better than that in the rural districts but as trade improved the lack of finished stock in the hands of some manufacturers, as well as numerous embargoes placed by many of the railroads, then made deliveries slow and unsatisfactory.

Yet in spite of the difficulties which conspired to make 1922 an off year, and while no definite figures are available, it seems quite safe to say that the number of units manufactured during 1922 was greatly in excess of the output in 1921. To be sure during the latter year there was a decided slump in the number of warm air furnaces made as compared with 1920; nevertheless the improvement has been enough to be an encouragement to both manufacturers and dealers and to cause them to feel that if we can have a new year reasonably free from labor troubles and transportation difficulties the industry will not be long in getting back to normal and that 1923 will be a bigger and more profitable period.

It would seem that early buying will be in order but should something unforeseen cause a disappointment in this regard it is certain the manufacturers will not stock their goods to any extent for their margins are too close to justify any slower turnover than ordinarily exists in the industry. Developments during the past twelve months have not shown many marked changes in construction but the determination to make better goods and more efficient heaters has been apparent.

In the past year the Research Work carried on by the National Warm Air Heating and Ventilating Association at the University of Illinois reached the practical stage and will continue along that line from now on to the mutual benefit of manufacturers, dealers and consumers. It is hoped in the coming year to arrange for a house in which testing and Research Work can be conducted under the same conditions that are found in every day installations.



Allen W. Williams

The new Installation Code which was recently distributed should be of great help to all concerned. The many discussions during its formation have proven wonderfully educational and incidentally advertised in a very positive way the necessity for good installation. Even if the value of correct installation had already been pointed out thousands of times the full consideration that was had of this Code emphasized the fact that our system at least is right. Among other good things it will be noted that the Code is absolutely against the use of cellar air and it is to be hoped it will assist in eliminating this undesirable feature in installations and from which it is only ordinary justice to protect the uninformed home owner. The small additional expense necessary is certainly justified by the marked increase in efficiency and comfort secured when first floor or outside air supply is used. It would be helpful if some method of publicity could be devised and followed that will make at least the chief features of a good warm air heating installation a matter of more common knowledge for when the home owner is protected our industry is protected.

A few years ago the economy of fuel did not particularly interest the prospective purchaser of a warm air furnace, but 1922 has again painfully impressed upon the consumer the fact that fuel really does cost money and there will be an exceptional opportunity during the new year to convince customers of the real saving that will come through the purchase of a well-made, well mounted, efficient furnace to be properly installed and it will not be necessary for the dealers to labor like Greek slaves in an honest effort to convince a prospect that the first cost of a heating plant is about the last thing that should be considered.

One interesting and extremely important movement that seems to have started in earnest during the year that has closed is the distinct improvement in merchandizing methods in the matter of display rooms. For too long the majority of warm air heaters and accessories have been offered for sale in the midst of the most unattractive and forbidding surroundings.

Someone has said—"A sale is something that takes place in the mind of the buyer."

If this is true then most of the past purchasers of our goods must have had their minds made up before entering the market for there was little to influence them favorably and thus undoubtedly many sales were lost by the old uninteresting way in which our goods were presented to the public.

It is fortunate that there were

some progressive manufacturers and wide awake dealers, to whom a debt of gratitude is due, who realized the opportunity for improvement in the method of attracting customers. Furnace merchants who have made the comparatively small investment necessary to provide bright and attractive window displays and clean comfortable sales rooms have undoubtedly been rewarded with many additional sales. Incidentally an improvement of that kind when made has not only unconsciously increased the dealers' own respect for the warm air heaters and accessories, offered for sale, but what is more to the point—that of their customers. The manufacturers in our growing industry have a vital interest in attractive sales rooms for their distributors, for it is not at all fanciful to state that the procession of trade will naturally head toward bright clean and comfortable show rooms.

Triggs Foresees Still Greater Progress for Warm Air Furnace Industry.

President of Midland Furnace Club Compares Conditions Twenty-five Years Ago and Now.

IN THE following letter from James M. Triggs, President of the Midland Furnace Club the suggestion is made that the furnace manufacturers engage in a cooperative educational campaign to the general public for the purpose of bringing out the many advantages of warm air furnaces as against any other means of heating residences and also to give the public information as to proper methods of operating furnaces:

In the first place as a manufacturer of warm air heating specialties and furnaces I wish to express my appreciation to AMERICAN ARTISAN for the special effort that your organization has put forth in years passed in preparing the annual special warm air number entirely in the interest of the industry, which is of not only such vital importance to manufacturers, dealers, contractors, etc., but of equal importance to the vast number of home owners who have the privilege of enjoying the comforts of a well planned and correctly installed warm air heating plant.

As I look back over the past twenty years during which time I have been directly interested in the manufacture of warm air heating appliances a feeling of deep satisfaction comes to me, as it does to others who are manufacturing and installing a first class heating equipment, especially on a day like this with the thermometer registering twelve below zero, when we can feel that those at home are being comfortably heated through the efforts of those who have chosen this particular line of work for their livelihood.

There is something worth while in the things that we get out of life, and I really feel that men who have made a study of the warm air heating problem and who have insisted on proper circulation and capacity

James M. Triggs.

have a right to feel that they are members of a large army of business men and mechanics, benefactors to the comforts and conveniences of the great host of common people who find it necessary to make their homes comfortable in these colder climates and whose homes are held during the colder months at practically the same temperature that they enjoy during the summer months all through the efforts of our industry.

I also realize that since I became interested in this industry great progress has been made and a great deal of knowledge has been handed out to those who are responsible for proper installation through AMERICAN ARTISAN and other papers of similar character. I also believe that the present generation has a better knowledge of the requirements and the work of a warm air heating plant than those of twenty-five years ago, and due to this fact we have less problems to solve.

Yet I feel that the furnace manufacturers as a whole could do a wonderful piece of work in the promotion of the industry by aiding the coming generation as to the proper management of furnaces, proper circulation of air, draft, etc. While I am no prophet yet I really feel that as soon as the splendid work which is being conducted by the National Warm Air Heating and Ventilating Association at the University of Illinois under the supervision of Professor Willard is sufficiently advanced so as to give us a more complete knowledge, it would be wise to recommend to the Association a campaign of publicity that would enlighten those who are interested in proper heating, so that a much better understanding can be brought to the user and to the prospective furnace dealer and installer.

I really feel that our furnace industry as a whole is today on a much higher plane than it has ever been, entirely due to conscientious workmanship, which is absolutely essential to keep our industry in the position that it now holds on the part of home owners, who realize that our system is superior to any other

in the heating of residences, bungalows, stores, churches and that character of buildings which can be successfully heated by warm air.

I thank you again for the interest on the part of your organization in the work that you are doing and hope that your 1922 special warm air number will be the best ever and with kind personal regards.

Sees Warm Air Furnace Again Enthroned as Best and Most Economical Heating Plant.

President Pierpont of National Sheet Metal Contractors Points to Educational Campaign.

THE warm air furnace is again coming into its own. It has always been the most economical heater—that is, it has produced more heat at the least cost—but the failure of the trade to keep on the alert allowed the manufacturers of steam and hot water heating plants to assume the advantage. This advantage is now being overcome and education is doing it.

John A. Pierpont

Such are the main observations of John A. Pierpont, president of the National Association, Sheet Metal Contractors of the United States, whose seasonal greetings to readers of AMERICAN ARTISAN AND HARDWARE RECORD are as follows:

Looking back over the old guess method and faulty installation of warm air furnaces, one often wonders why laws were not enacted to prevent their use, but in spite of all guesswork on the part of the dealer, they appealed to the general public, from the fact that even under adverse conditions, warm air furnaces produced better results for the money than any other method of heating.

And it is most gratifying at this time to be able to say that under the present method of installation they are gaining a stronger foothold, among those who are building homes for their own use, than ever before because it is undisputable that they cost less to install, are less expense in upkeep, will burn any kind of fuel, and as long as any parts remain they can be repaired at small cost, and made to give good service.

This was brought about through an educational program of the national and local associations together with the manufacturers and jobbers, who have carried on a campaign of advertisement, showing the advantages of warm air heat over steam and hot water, together with the improved method of installation.

This is an entire change over the old method, and today the architects and owners are giving more careful consideration to the warm air furnace, with its great advantage of first cost and simplicity of operation, both of which cannot be equaled by any other system of heating.

One of the most important things to the furnace trade in general this past year was the adoption of the Standard Code, regulating the installation of warm air furnace, by the National Association, Sheet Metal Contractors of the United States, at Indianapolis, Ind., last May. This was ratified by the three committees at a meeting in Chicago recently, and is now ready for distribution.

This Code, if carried out by those installing warm air furnaces, will mean better business from year to year, and place the warm air furnace at the head of the list of heating and ventilating systems.

Use Mossy Zinc As Soot Cleaning Compound.

Here is another use for zinc, according to the American Zinc Institute—the use of mossy zinc as a soot-cleaning compound. This metallic zinc, when thrown on top of a hot fire, oxidizes, and in this very fine hot state (such as the oxide is in, due to its being freshly formed on a hot fire) it apparently has some cleaning action on the soot in chimneys and flues, because the hot carbon very readily reduces the zinc oxide, and, by alternate reductions and oxidations of the zinc, the carbon is burned out of the flues. Many people have found that this is a very satisfactory way of cleaning soft coal soot out of flues and stacks.

An inch of smile is better than a yard of frown.

Both Manufacturers and Installers Are Meeting New Demands for Better Heating and Ventilating

Edwin L. Seabrook, National Secretary, Sheet Metal Contractors, Cites Industry's Progress.

BETTER heating and ventilating are demanded in present-day house construction, and that demand is being met, both by the manufacturer who is producing a better heat generator and by the installer who is now, with the adoption of the new code, proving his ability to keep march with progress.

Such is the inspirational message to the warm air heating industry of Edwin L. Seabrook, secretary of the National Association Sheet Metal Contractors of the United States. Mr. Seabrook believes the industry is on the upgrade and that the poor installer is on the downgrade. His special article to AMERICAN ARTISAN AND HARDWARE RECORD follows:

Evolution and the Warm Air Furnace Industry.

If there is such a thing as evolution, then the warm air furnace industry is certainly witnessing and experiencing its operation.

Evolution always operates in one direction—upward from the lower to the higher. The results of each step are always a little better than the preceding one. It looks far ahead, even into the dim distance, sees perfection as its ultimate goal and makes the never-ceasing advances toward it.

Who can say that warm air heating is not evolving from good to better and is advancing to its rightful position, best!

One of the advanced steps has been the compilation of a standard code and its adoption by the three leading associations interested in warm air furnace heating. It should be borne in mind that evolution is a developing process and not perfection. Those who adversely criticize the code could not write a perfect one. A committee of humans that could compile a perfect warm air heating code with the present scientific knowledge available would be a wonder.

For the first time there is a standard code available for the warm air furnace heating contractor. It can be used in any section of the country. It can be incorporated into the building codes of municipalities. How often in the past have cities adopted building codes with no mention of warm air furnace heating; or if there was anything in the code, it neither safeguarded the health, nor provided for efficient installation. The standard code makes provision for both of these.

Edwin L. Seabrook

The manufacturer has turned the results of scientific tests and investigations into the production of a better heat generator. Some generation-old practices, which were thought to be all self-sufficient are being discarded. Science deals with facts, and what these disclose cannot long be disregarded.

If house structures are built no better than they were in the middle of the last century, the interiors are certainly planned with improved ideas of heating and ventilating Much publicity has been given both of these. Better heating and ventilating are demanded in present-day house construction by the home owner. A demand for the better or best always finds a response from those supplying such demands.

A new generation of warm air furnace dealers and installers is being educated along modern lines and in harmony with the scientific facts developed through investigation and research. Beyond any question, this means better and more efficient installation. There is much poor installation, there always will be while people exist who will not pay the price for what is good and worth while, or who are content with something that is even *less* than good, to say nothing of better or best.

There is no question but what warm air furnace installation is on the upgrade. The complaints regarding this feature, the agitation during the last ten years for better work, has driven the poor installer more and more in the background or compelled him to study, adopt and apply the best there is available in warm air heating plant construction.

Every one who will carefully and impartially study warm air furnace heating for the past twenty years must reach the conclusion that the law of evolution is working in that particular industry.

Ten Commandments of Business.

Handle the hardest job first each day. Easy ones are pleasures.

Do not be afraid of criticism—criticise yourself often.

Be glad and rejoice in the other fellow's success—study his methods.

Do not be misled by dislikes. Acid ruins the finest fabric. However, both dislikes and acids may be used to advantage.

Be enthusiastic—it is contagious.

Do not have the notion that success means simply money-making.

Be fair, and do at least one decent act every day in the year.

Honor the chief. There must be a head to everything.

Have confidence in yourself, and make yourself it.

Harmonize your work. Let sunshine radiate and penetrate.

Warm Air Heating Industry Has Taken Vast Strides Forward in Year, Declares R. W. Menk.

Retiring President of Western Association Also Points Out Progressive Steps Ahead.

IN HIS survey of the year just concluded, R. W. Menk, retiring president of the Western Warm Air and Furnace Supply Association, declares that the industry has taken marked steps forward, which makes him much more optimistic. In the following article, written for this special number of AMERICAN ARTISAN AND HARDWARE RECORD, Mr. Menk analyzes his optimism and also enumerates other progressive steps which he feels the industry should take if it is to be alive to its opportunities and responsibilities. He writes:

The first paragraph in my article published in your *Warm Air Heater Special* of a year ago stated that "The future of the Warm Air Industry, and the position it would hold with other methods of heating, crime against Warm Air Heating, there have also been many additional thousands of installations made that are a benefit to Warm Air, many of which can be directly credited to the efforts of those who have the best interests of the industry at heart.

The good work of the trade journals is especially commendable and continues to uplift, also the work of associations (while not half enough) have all had their effect for the better.

Associations especially can put depended upon the vision, inspiration and will power put into Warm Air Heating by those engaged in the line." I also raised the question of whether it would be elevated to a higher standard or whether the makers of furnaces and accessories would be content to follow the same beaten paths and can frankly say that there have been improvements and in some particulars very marked changes have developed to such an extent that there are many, including myself, who are much more optimistic than they were a year ago.

While there is still much room for improvement and installations continue to be made that are a forth greater efforts to improve the industry by advocating the standardizing of a great many details between the factory or foundry and the ultimate user of the apparatus in order to develop the high standard that is due the little old "hot air" furnace of the past.

The standardization of furnaces has made some headway but will

R. W. Menk.

have to continue in the mill for a few years more, or until the work at the Illinois University has progressed to such a stage as to put the various apparatus to the acid test. Let us, however, not be alarmed over this delay for there are many other items of greater importance just now.

The adoption of a standardized installation code by the three Associations most vitally interested was one big step forward, and while we do not all agree that it is just exactly to our liking, one needs only to refer to the making of our own United States Constitution, made many years ago, to get enlightenment that its makers also did not agree, as many of the signers were much opposed to certain clauses. Therefore, let us all boost the code and advocate its adoption with the assurance that whatever errors it may contain will soon, or ultimately, be corrected.

Standardization of operating instruction cards, estimating and specification blanks will work out to advantage, especially the operating instruction card, and I am sure one can see the advantage of same by a little reflection.

The possibilities for the greater improvement of Warm Air Heating lie in many channels, one improvement especially that requires further development is the fan and blower. Not that warm air heating cannot otherwise be installed satisfactorily, but that by the use of the fan or blower greater efficiency can be procured. The fan also affords the installation of warm air furnaces in many buildings and in many ways, which would be impossible with gravity circulation.

Hope of the future for the Warm Air Industry lies in our willingness to get behind every proposed movement that tends to elevate and promote its sale. Don't blame the home-owner if he condemns Warm Air. Don't blame the installer if the installations are unsatisfactory. Don't blame the architect if he tries to induce his clients to use other methods of heating. The conditions are just as the furnace manufacturers made them and if they are ever to be corrected it will have to be by the efforts of those who are willing to pay, with their time, efforts and money, the price necessary to put Warm Air Heating where it belongs.

Many people are dissatisfied with their pay when they ought to be dissatisfied with themselves. We need to take frequent inventory—inventory of our mental habits; our stock in trade or progressive, up-to-the-minute information about goods and business methods; and of our actual business-building value to the firm. And when we take inventory, we must be honest—the silliest thing of all is to fool ourselves.

Western Warm Air Furnace & Supply Association Proud of Standard Code.

Secretary Hussie Believes Move Is Great Step to Better Installations.

THE adoption of the standard furnace code is the outstanding feature of the year in the warm air heating industry, in the opinion of John H. Hussie, secretary of the Western Warm Air Furnace & Supply Association. In his annual review of business conditions, written specially for AMERICAN ARTISAN AND HARDWARE RECORD, Mr. Hussie declares that the adoption of the code will prove not only a boon to the industry, but by reason of better installations will work to the good of the public. Mr. Hussie's article follows:

The Western Warm Air Furnace & Supply Association and the New Code.

The Western Warm Air Furnace & Supply Association is well and prosperous and its secretary is, therefore, well fed and happy.

The Western has reason to rejoice over the birth of that bouncing boy, the Standard Furnace Code. While the Western does not exactly claim to be both father and mother of this child, it at least may claim to be a step-father or some such relation through marriage. (Hope this isn't too complicated.)

For many years, furnace manufacturers talked about getting out a furnace installation code but nothing seemed to come from all of the talk until the Western Association hurled a bomb into the too peaceful camp by introducing a bill in the legislature of the State of Nebraska, asking that a furnace installation code, endorsed by the Western and National Sheet Metal Contractors be enacted into a law.

The echo of this explosion penetrated even into the mountain fastnesses of the darkest East. The result is that manufacturers, jobbers and installers got together and produced the Standard Code that has just been given to the public. This, in my judgment, is a great stride toward better furnace installations. True there are a few critics who profess not to like it.

Strange as it may seem, however, the furnace manufacturers, furnace dealers and furnace installers all seem to believe that the Code is good and that a furnace installed in accordance therewith will be a pretty good job, while the ones who do not like it seem to be men engaged in some other line of business. These gentlemen could possibly have written a better Code but they did not write one and I think never would have.

John H. Hussie

I have met men who thought they could have improved on the Declaration of Independence, had they been called upon, but the Declaration has served its purpose very well.

My suggestion to furnace installers is—Start installing your furnaces according to this Code, see how much you can improve on it as you go along, making each installation better than the preceeding one. If this is done, warm air heating will soon be known as the ideal method for homes.

With regard to the furnace situation for the coming year, it seems that manufacturers are in a somewhat difficult position. Buyers want to know what prices for the first half of the year will be and no one seems to know. Everyone feels that the present price of pig iron is too high but no one is brave enough to prophesy what it will be next year.

I have not changed my views since I wrote you a year ago on this same subject. The price of iron, the price of manufactured articles and the price of labor is out of proportion with the price paid the farmer for his produce and farmer's prices must come up or our prices must come down.

I look for a great year in the furnace industry next year and while manufacturers, as indicated above, will have their troubles, during the early days of the year, I am optimistic enough to believe that it will all come out in the wash and we will all make a little profit.

I wish to thank the ARTISAN for its consistent and intelligent efforts to assist all those interested in the Warm Air Heating industry and for its fair and impartial treatment of all questions that have arisen relating to the industry.

The Man Who Knows Makes Best Customer.

Wise manufacturers are glad to do business with discriminating merchants because they have confidence in the "man who knows and knows that he knows." It is the man who does not know and buys carelessly who causes all the credit worry. So, if for no other reason, manufacturers welcome the opportunity to work with a merchant who is keen enough to study his business and learn how goods are made that will increase his trade and make the account grow, because he is a better credit risk than the easy going merchant.

Carnegie once said: "It marks a big step in a man's development when he comes to realize that other men can be called into help him do a better job than he could do alone."

Rating of Furnaces Must Be Based on Register Temperature as Well as Leader Pipe Area.

Professor Willard Makes It Plain Why the Latter Is Not a Safe Guide as to Furnace Capacity.

By A. C. Willard, Professor of Heating and Ventilation and Head of Department of Mechanical Engineering, University of Illinois.

ONE of the most important objects of the research work of the Warm Air Furnace Heating Investigation, which is now in progress at the University of Illinois, has been the determination of the factors

A. C. Willard.

affecting the rating of a warm air furnace. Every manufacturer is vitally concerned with the basis upon which furnace ratings are determined. Most manufacturers are agreed that the square inches of leader pipe area which a furnace can supply is a satisfactory basis for expressing the heating capacity of a furnace. Unfortunately, this is not the end of the story by any means, as such a basis of rating is still indefinite, unless the air temperature at the registers is also stated.

The real significance of this air temperature at the registers can be shown very easily by reference to any series of tests run at the University on piped furnaces. In fact, it is a very simple matter to show that a given furnace, connected to a given system of leaders, stacks, and registers as shown in Figure 1 can be made to develop several different heating capacities when operating *with the same number of square inches of leader pipe area.* It is only necessary to increase the draft,

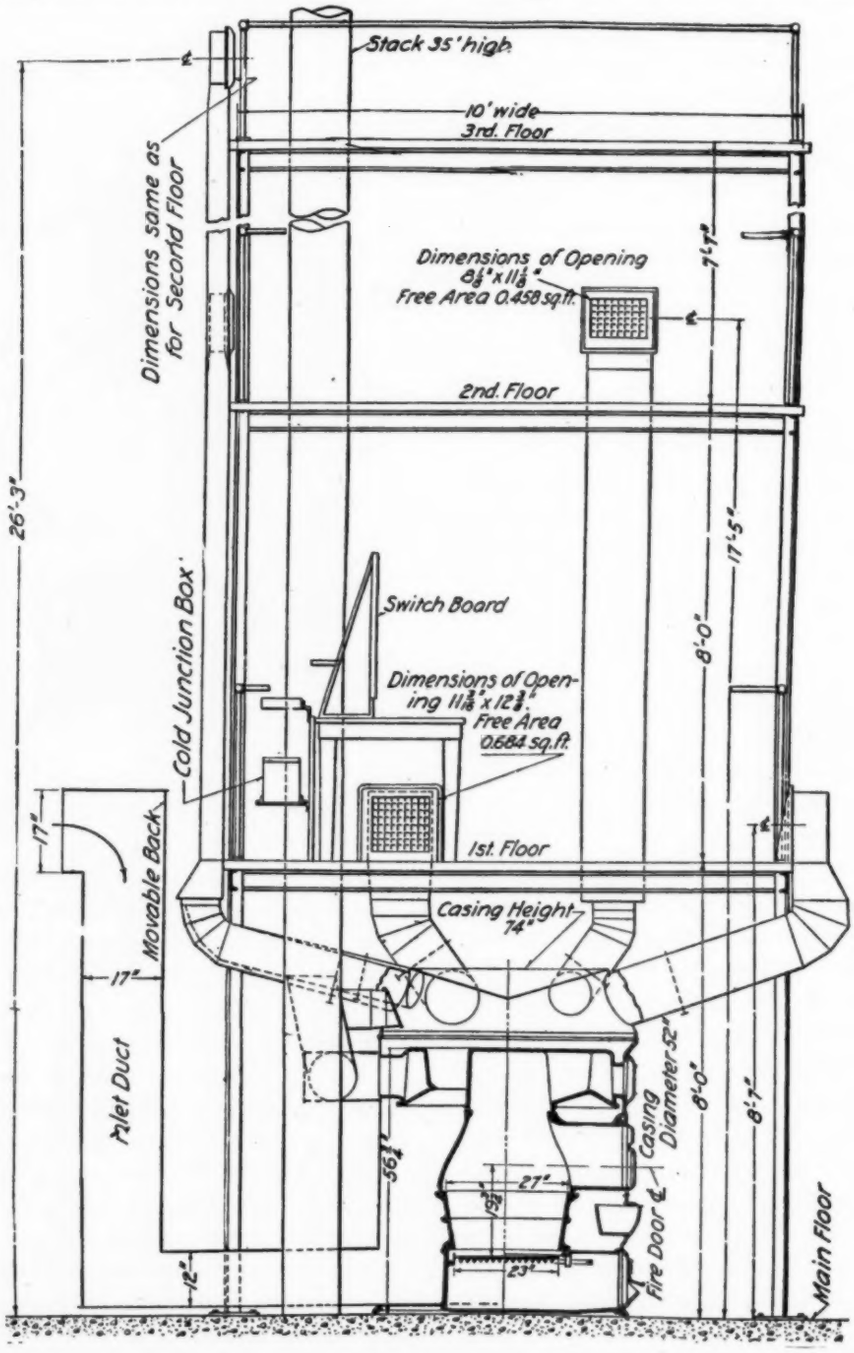


Figure 1.—Sectional Elevation of Piped Furnace Testing Plant. From Bulletin 120, University of Illinois, Engineering Experiment Station.

thereby burning more coal per square foot, of grate, and as a consequence secure a higher air temperature at the register face. That the heating capacity of the furnace will be increased by such a procedure is obvious to anyone, and it should be equally obvious that any attempt to express the rating of a furnace in square inches of leader pipe area means nothing unless the register temperature is stated at the same time.

In order to illustrate just how important this item of air temperature at the registers really is, the results of three tests on the piped furnace plant (Figure 1) are presented in Figure 2 and analyzed. Absolutely no changes were made in the furnace or plant during these tests. In the right hand half of the figure each inclined line represents one test; the lowest line shows the results from a test with the air temperatures at the registers for the three floors averaging 141.2° F., the middle line is taken from a test with an average register temperature of 175.8° F., and the upper line represents the results of a test with an average register temperature of 197.5° F. The horizontal axis indicates the height of the register above the grate in feet, and the vertical axis gives the heating effect produced in the room per square inch of leader pipe area.

For example, during the first or low temperature test, each square inch of leader pipe to the first floor registers supplied 50 B. t. u. per hour for useful heating effect in the rooms, each square inch of leader pipe to second floor registers supplied 89 B. t. u. per hour for useful heating effect in the rooms, and each square inch of leader pipe to third floor registers supplied 122 B. t. u. per hour for useful heating effect in the rooms. At this time the draft was 0.05 inches of water and the combustion rate was 3.8 pounds of coal per square foot of grate.

By merely increasing the draft to 0.14 inches of water, the combustion rate in the second test increased to 5.6 pounds of coal per square foot of grate and the average air temperatures at the registers became 175.8° F. This raised the useful heat carrying capacity of each square inch of leader pipe for the first floor from 50 to 103 B. t. u. per hour, for the second floor from 89 to 153 B. t. u. per hour, and for the third floor from 122 to 204 B. t. u. per hour. A further increase of the draft to 0.16 inches of water gave a still higher combustion rate of 6.5 pounds per square foot of grate and correspondingly greater heat carrying capacities for each square inch of leader as shown in the upper curve of the right hand half of Figure 2.

The left hand half of Figure 2 shows the air velocities in the leaders to each floor for each test. A glance at the curves (each curve represents one test) will show that the velocity and hence the quantity of air delivered was materially increased each time the register temperature was increased, hence *an increase in register temperature not only adds more heat to each pound of air supplied at the registers, but also increases the number of pounds of the hotter air which is supplied.* In all cases the leader area was the same.

It is also possible to determine exactly just what effect the changes in air temperature at the registers has had on the heating capacity of this furnace and plant. The first floor leader area is $4 \times 113 = 452$ square inches, the second floor leader area is $2 \times 50 + 2 \times 64 = 228$ square inches, and the third floor leaders area is $2 \times 64 - 128$ square inches,

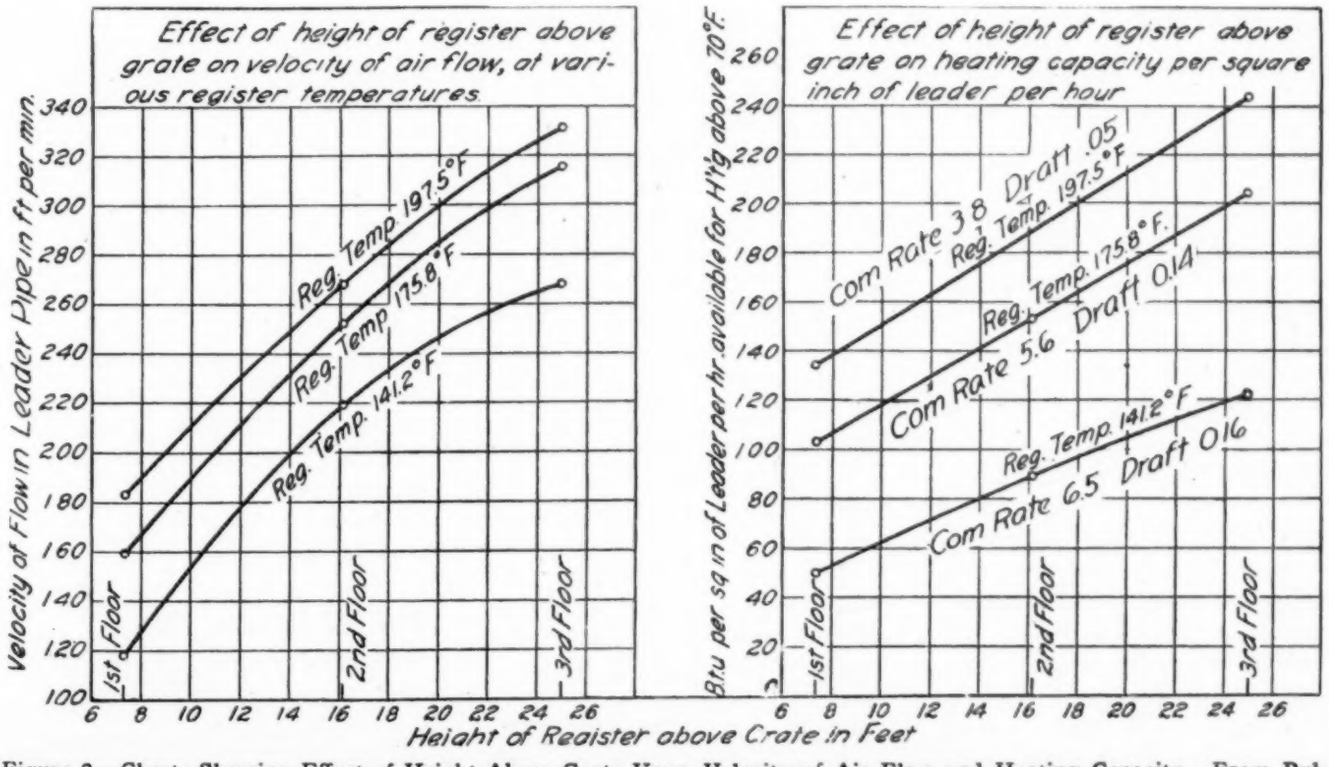

Effect of height of register above grate on velocity of air flow, at various register temperatures
Velocity of Flow in Leader Pipe in ft per min.
Reg. Temp. 197.5°F
Reg. Temp. 175.8°F
Reg. Temp. 141.2°F
1st Floor
2nd Floor
3rd Floor
Height of Register above Grate in Feet
Effect of height of register above grate on heating capacity per square inch of leader per hour
B.t.u. per sq in of Leader per hr. available for H'g above 70°F.
Com Rate 3.8 Draft .05
Reg. Temp. 197.5°F
Reg. Temp. 175.8°F.
Com Rate 5.6 Draft 0.14
Reg. Temp. 141.2°F
Com Rate 6.5 Draft 0.16

Figure 2.—Charts Showing Effect of Height Above Grate Upon Velocity of Air Flow and Heating Capacity. From Bulletin 120, University of Illinois, Engineering Experiment Station.

or a total of 808 square inches. The free area of the furnace is 838.4 square inches. Hence this furnace developed the following useful heating capacities (that is, heat supplied at registers for heating rooms to 70° F.) in each of the three tests:

Test Number 1.

Register temperature = 141.2° F. (Draft = 0.05 inches and combustion rate = 3.8 pounds per square foot of grates.)

452 × 50 = 22,600
228 × 89 = 20,300
128 × 122 = 15,600

58,500 B.t.u. per hour

Test Number 2.

Register temperature = 175.8° F. (Draft = 0.14 inches and combustion rate = 5.6 pounds per square foot of grate.)

452 × 103 = 46,600
228 × 153 = 34,900
128 × 204 = 26,100

107,600 B.t.u. per hour

Test Number 3.

Register temperature = 197.5° F. (Draft = 0.16 inches and combustion rate = 6.5 pounds per square foot of grate.)

452 × 134 = 60,500
228 × 168 = 38,400
128 × 243 = 31,000

130,000 B.t.u. per hour

By merely increasing the draft and combustion rate, the register temperature has been raised from 141.2° F. to 197.5° F., and the heat-capacity has been increased from 58,500 to 130,000 B.t.u. per hour, or an *increase* of 122%, *but the free area through the furnace, and the leader pipe area has remained the same.*

It should, therefore, be apparent that the rating of any furnace in square inches of leader pipe area means nothing unless the air temperature at the registers is also definitely stated at the same time. The preceding discussion is in no sense an agreement against rating on the free area basis, but rather an argument to show the manufacturer and the installer the vital importance of fixing upon some standard register temperature, so that ratings in square inches of leader pipe area will be definite and can be made comparable and understandable by both the manufacturer and the engineer. The Advisory Committee on Furnace Research of the National Warm Air Heating and Ventilating Association has recently approved a maximum register temperature of 180° F. for warm air furnace heating systems.

Every manufacturer of warm air furnaces should give this matter his careful consideration for the fixing of the register temperature places a definite maximum rating on each of his furnaces.

High Fuel Prices Help Sales of Heat Regulating and Humidifying Devices.

The following editorial from the December issue of *Heating and Ventilating Magazine* applies with equal force to the warm air furnace installer.

Attempts to familiarize the public with modern heating and ventilating methods have made such comparatively slow progress and the advances in the art have been so rapid, that there is still a remarkable lag between what the industry has to offer for the comfort of the public and the public's appreciation of these comforts. Since the present coal shortage has brought home the need of more careful attention to the economical heating of buildings, many householders and others are now getting their first knowledge of such devices as temperature regulators and humidifiers, to say nothing of hygrometers and humidostats. Yet to tell the average householder that his daily humidity requirements are a matter of gallons of water, rather than quarts, comes as a total surprise.

That there is, however, an awakening going on is evidenced by the attitudes now being taken by many doctors in recommending the use of humidifying devices in the home and in the increased number of inquiries regarding such devices. For instance, one house owner writes: "I hear a good deal these days about hygrometers and humidostats, but where can I buy them? Our local heating man (he wrote 'plumber') does not keep them and does not seem to know the first thing about them." If this situation is at all general, and we believe it is, it offers a fine opportunity to the industry to link up a sales campaign with one to familiarize the heating contractors and dealers, as well as the public, with the various types of air moistening devices, heat-regulating systems and other means for promoting health and economy.

"My wife," continues our correspondent, "has been reading up on the latest and most up-to-date methods of heating and ventilating the home, because we are paying $14.00 a ton for coal and find it scarce at that figure. We would buy some of these economy devices today if we knew just where to get them."

Before the winter is out we dare say the householders throughout the country will have gained more heating information than they ever had before. What is more, they are already in a most receptive frame of mind for suggestions as to methods of conserving their fuel and of providing ideal air conditions in their homes. The men in the industry are pretty well versed in the principles of both heating and ventilation and it now remains for them to show the public in a practical way how these principles may be applied and where the necessary equipment may be obtained. In other words, what is needed is a concerted effort to place on the shelves of the dealers the very appliances which are declared to be so useful in saving coal and in promoting health and then to furnish the dealers with full information as to their purpose and operation so that they will not be "stumped" by the layman when he starts taking humidity and the wet-bulb.

Midland Furnace Club Will Meet January Fifth.

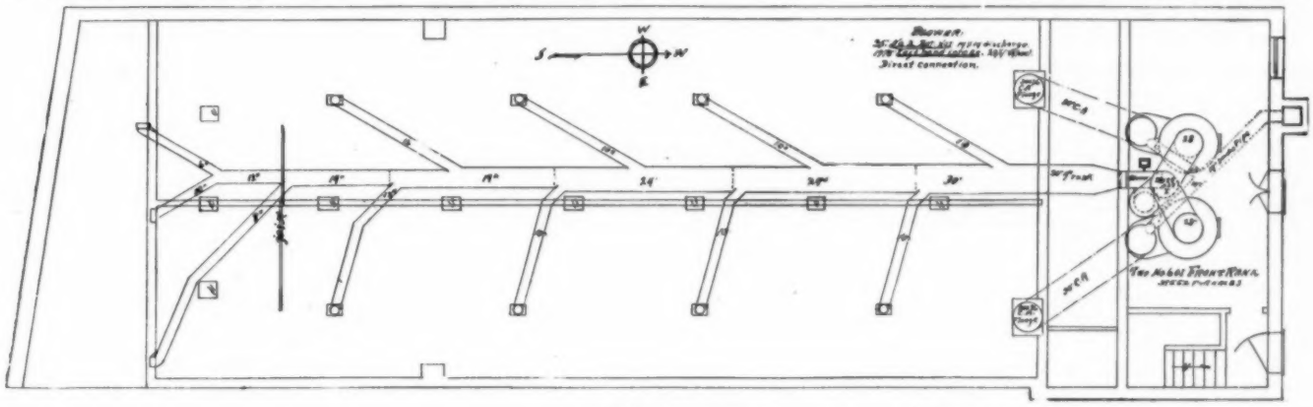
The Midland Furnace Club will hold a meeting Friday, January 5th, at the Congress Hotel, Chicago, starting at 10 a. m.

Twin Furnace Installation with Blower Attachment for Arkansas Theatre Building.

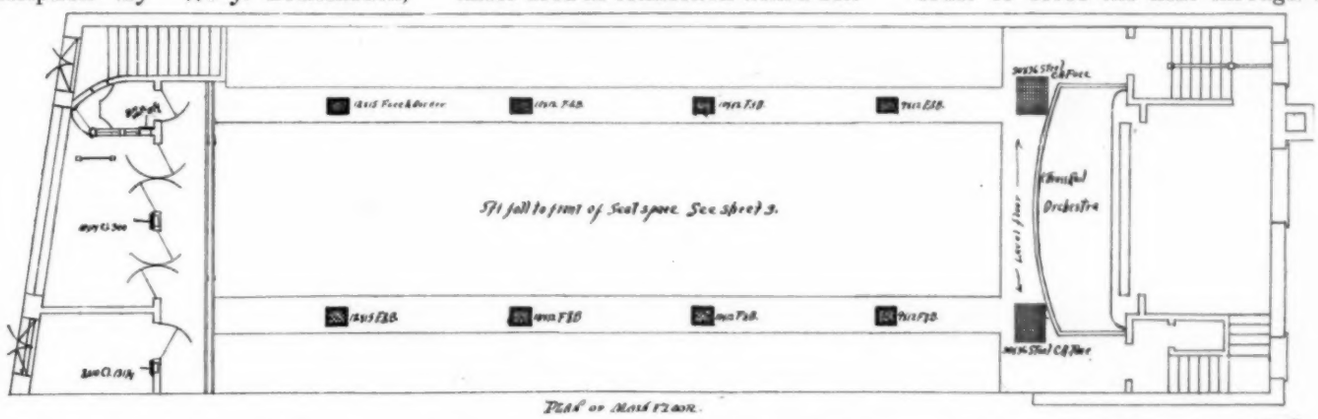
The Unusual Features of This Installation Are Well Worthy of Your Careful Study.

IN THE accompanying illustrations are shown the plans for an installation of a twin warm air furnace heating and ventilating plant for a theater building, under conditions which in several respects were out of the ordinary and the illustrations and the following description by W. J. Breitenbach, Heating Engineer of the Haynes-Langenberg Manufacturing Company, St. Louis, Missouri, will therefore, no doubt, be studied with much interest:

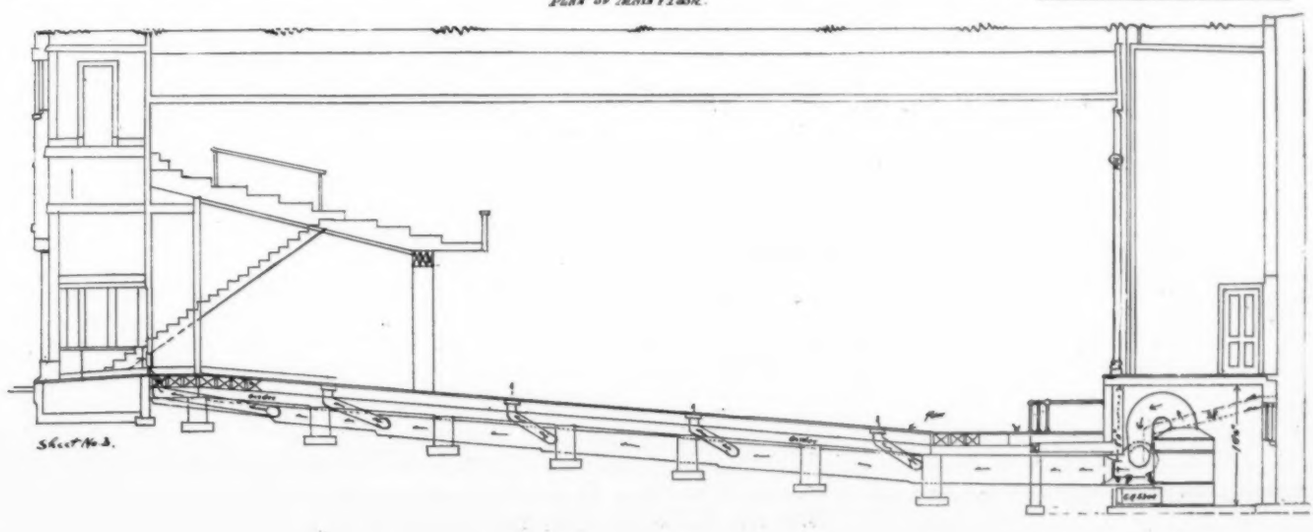
"The illustrations shown herewith cover the installation of two Number 601 "Front Rank" steel furnaces used in connection with a belted drive blower in a theater building at McGehee, Arkansas. The building was designed along the lines of theaters which are used in the smaller towns. After the heat requirements were determined, it was found that two Number 601 "Front Rank" furnaces would be necessary to heat the entire building to an even and comfortable temperature in severest of weather. With the furnace room at the extreme end of the building, this could not be accomplished by a gravity system, and it was necessary to use a blower in order to force the heat through a



HEATING PLAN FOR THEATER BLDG. AT McGEHEE, ARK.
BY
HAYNES-LANGENBERG MFG. CO. ST. LOUIS MO.



PLAN OF MAIN FLOOR.



Sheet No 3.

long trunk line, running the length of the building and thence to the various warm air registers.

"This theater has a sloping floor which is customary in theater construction. The cold air was taken from the lowest floor level and a separate duct runs to the base of each furnace. To reduce the noise to a mimimum, a belted drive blower was recommended. However, this could not be installed at the rear of the furnaces, which is the usual custom, on account of limited basement space. The blower was placed on a substantially constructed platform in such a position that the warm air outlet would run directly below the floor joists. A large warm air pipe was taken directly from the top of each furnace and then connected to the inlet of the blower by a single pipe.

"This method of taking the air from the furnace is called the pulled through method and can be installed satisfactorily where basement conditions will permit."

Well Prepared Advertisement Brought Customer for Church Installation of Duplex System.

W. H. Williams Ascribes His Success to His Advertising Policy and Cooperation from Manufacturer.

AN UNUSUAL installation of a pipeless warm air furnace is shown in the accompanying illustration. The work was done by W. H. Williams, 33 North Gay street, Baltimore, Maryland, from plans furnished by the engineering department of the Majestic Company, Huntington, Indiana.

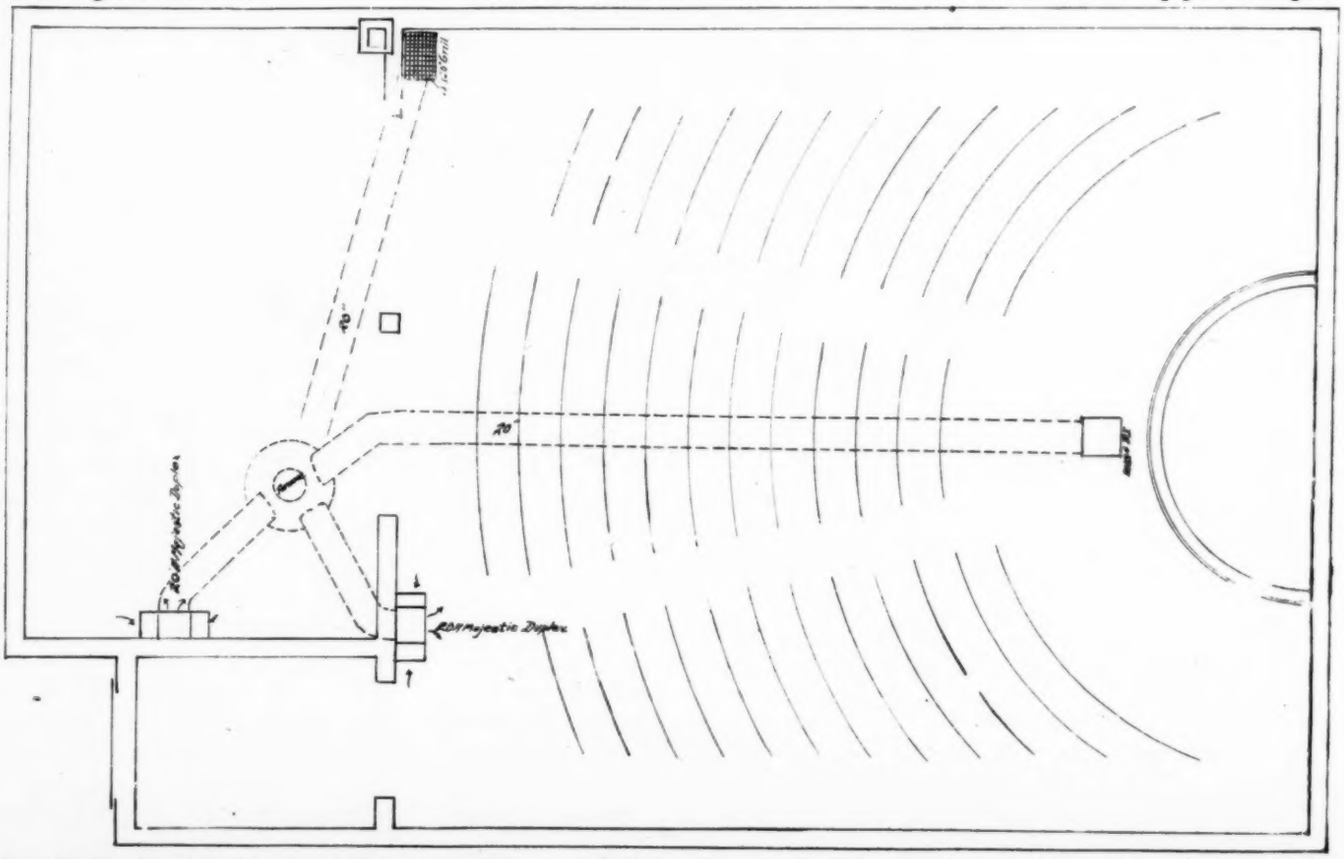
The "board" of the "M. P." church at Webster, Maryland, wanted to have a warm air furnace installed, but for some reason did not desire a regular pipe installation and yet it was necessary to provide some means for heating the Sunday School room—the section shown at the left in the illustration.

After some discussion it was concluded to buy an "egg stove" for this purpose, but before the purchase was made somebody on the board saw an advertisement of the Majestic Duplex Heating System in one of the Baltimore newspapers and they got in communication with Mr. Williams, with the result that he made a contract with them for the installation as shown.

Here is Mr. William's letter describing how he obtained the contract, how the installation was done and how the plant operates:

"After being told that it would be impractical to make an extra run to the Sunday School room, it was then decided to heat this room with an egg-stove. Then seeing my advertisement in one of their papers, they decided to have me submit an estimate, and the job was installed as per the sketch mailed you.

"By using dampers in the pipes the heat can be thrown into either the church or Sunday School room or both, as desired. Provision was also made for heating the basement of the church by closing the dampers in the two main pipes and open-

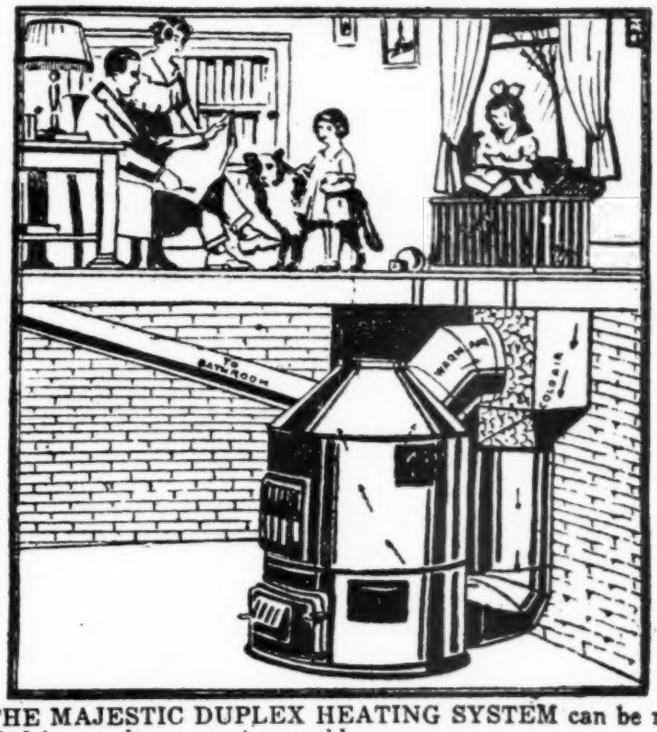


Installation Plan for Warm Air Furnace in Church at Webster, Maryland, Using Duplex Registers, Executed by W. H. Williams, Baltimore, Maryland.

ing a door in the bonnet of the furnace; also a slide was placed in the floor register heat pipe, near the elbow, which was to be opened when the damper was closed; thus distributing the heat to both ends of the room."

The advertisement shown in the accompanying illustration is one of a series run by Mr. Williams in *The Baltimore News* and it is interesting to note in his letter that he ascribes the obtaining of this contract to the fact that somebody read his advertisement; also that he has installed more than one thousand Majestic Duplex registers in connection with his furnace work

The MAJESTIC
Duplex Heating System



THE MAJESTIC DUPLEX HEATING SYSTEM can be readily installed in any home or store—old or new.

The Majestic Duplex Register is an attractive, useful piece of furniture that heats as no other register can. It locates to advantage—next to the wall or as the base of colonnades between rooms, takes up less floor space than the pipeless floor level register, and discharges a large volume of clean, healthful heated air at floor level—eliminating draughty floors, cold corners and overheated ceilings.

If you are considering installing a heating plant this fall, it will pay you to look into the merits of the Majestic.

Write for our booklet "BETTER HEATING," and obtain prices. This heating system can be paid for in monthly installments.

W. H. WILLIAMS

332 N. Gay St. Baltimore, Md. Phone CAlvert 2850

The Advertisement That Brought the Church Job of Installation to W. H. Williams, Baltimore, Maryland.

Building Boom in Small Homes Helps Warm Air Heating Industry, Say Manufacturers.

Most Makers Report Volume of Production Has Been Stimulated By Small Home Building Demand.

HAS the shortage of dwelling houses had any appreciable effect upon the volume of Warm Air Heater production during this year?

Furnace manufacturers, interviewed by AMERICAN ARTISAN AND HARDWARE RECORD on the foregoing question, generally replied in the affirmative, although there was a variety of viewpoints presented.

For instance, the Case Furnace Company of Seattle, Washington, who are in reality jobbers and manufacturers' agents, replied as follows:

"The business here in the Northwest has been better this year than for some years. It is not where it should be, however, due, I am afraid, to the many unsuccessful pipeless furnaces installed by inexperienced dealers. The pipeless furnace is losing out very rapidly here; in fact, it has lost out."

One of the largest of the St. Louis stove and furnace manufacturers writes:

"The shortage of houses has certainly stimulated the sale of this business during the past year."

A similar viewpoint is held by the Campbell Heating Company of Des Moines, Iowa, as expressed by Horace D. Campbell, as follows:

"Helped it by stimulating building to more rapid recovery than business in general.

"We believe it (the dwelling house shortage) has," asserts a well-known Milwaukee manufacturer. "The fact that the small house was such an important factor in the past season's building activities undoubtedly stimulated the demand for Warm Air Heaters."

Quite a number of the replies were non-committal or qualified as "To a limited extent," "We believe so," "Yes, the shortage of homes caused a large volume of home building," "Have not noticed any shortage," "We have no way of telling," etc.

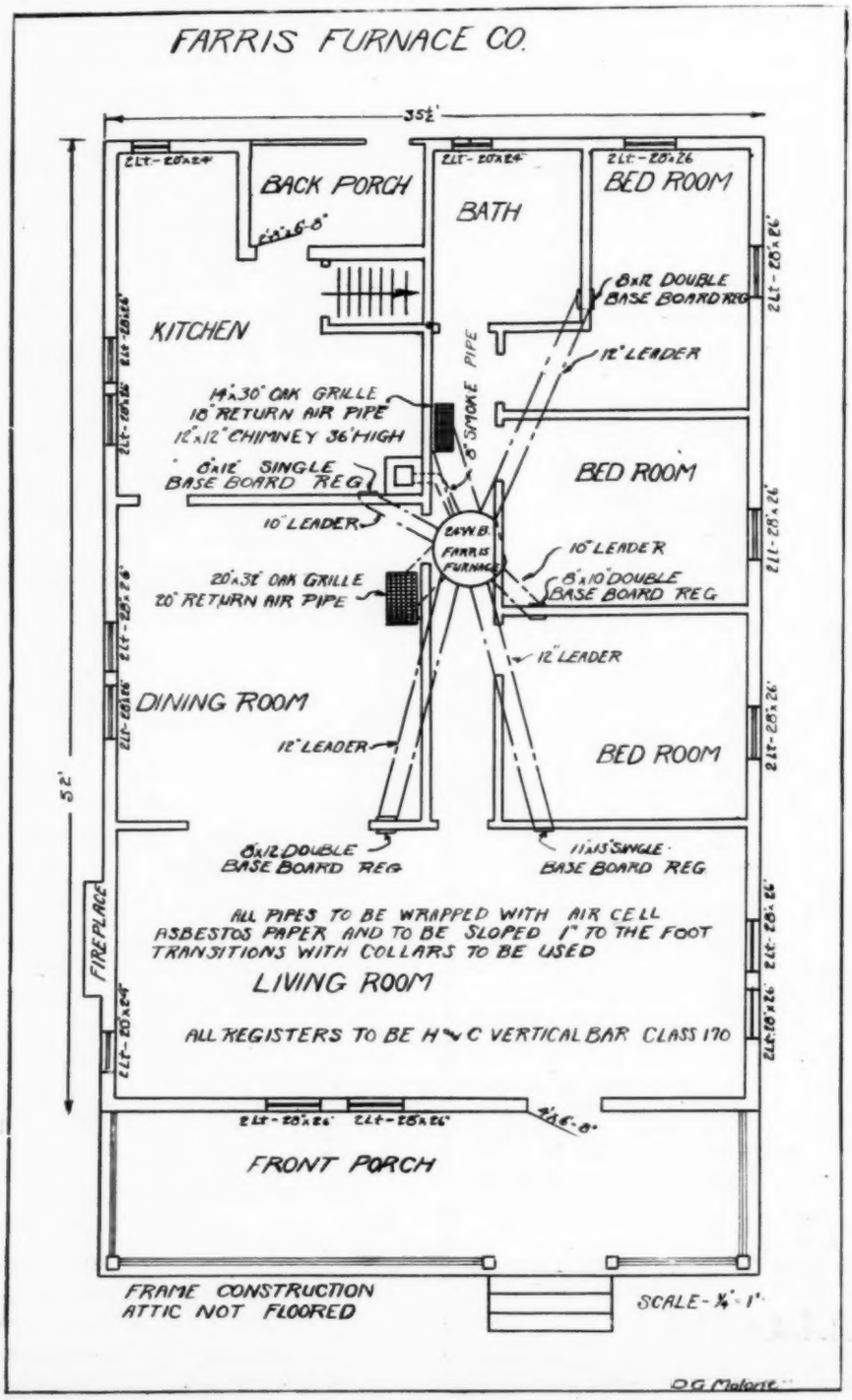
One manufacturer took a contrary view, declaring "sales much less, due to house shortage or some other cause," and still another asserted: "There are so many other factors affecting the demand for warm air furnaces it is impossible to answer this question intelligently."

Installation Plan for Warm Air Furnace for a Six Room Bungalow.

Two Return Air Ducts Are Provided and All Warm Air Pipes Wrapped with Corrugated Asbestos.

THE use of an over-size furnace with two return air ducts and all basement heating pipes insulated with corrugated asbestos board, are the principal features of the installation which is described in the following by C. H. Spaulding, of the Farris Furnace Company, Springfield, Illinois.

"The accompanying illustration shows how the heating problem of a six room bungalow may be treated to obtain thoroughly practical results in comfort and efficiency.



Installation Plan for Warm Air Furnace in Six Room Bungalow.

"The first important feature is the chimney which, as specified, is probably better than the average, but which is an ideal to be held before every builder. It determines the ultimate capacity of the heating plant.

"Two return air ducts are provided in order to maintain complete circulation when the living side of the home is shut off from the sleeping rooms and bath, as may frequently be required. Warm air pipes are all wrapped with air cell asbestos insulation, one ply. This minimizes the difference in the carrying capacity of long and short pipes by reducing the loss of gravity head due to cooling in long leaders.

"Pipes and register sizes are computed in accordance with the Standard Code Regulating the Installation of Warm Air Furnaces. The size of furnace is one size larger than actually required by computation. The advantage in this case is a fool-proof precaution, as many a man will try to warm his house with a fire pot half full of ashes. In other words, we cannot expect as efficient operation of a heating plant by the general public as by the heating specialist.

"Last but not least, the Water Base Farris Furnace is specified, as in our opinion humidity is as important as temperature to the health and comfort of those who live in the house. With this furnace a guarantee of 40-50 per cent relative humidity is right in line with 70 degrees temperature in any sort of weather."

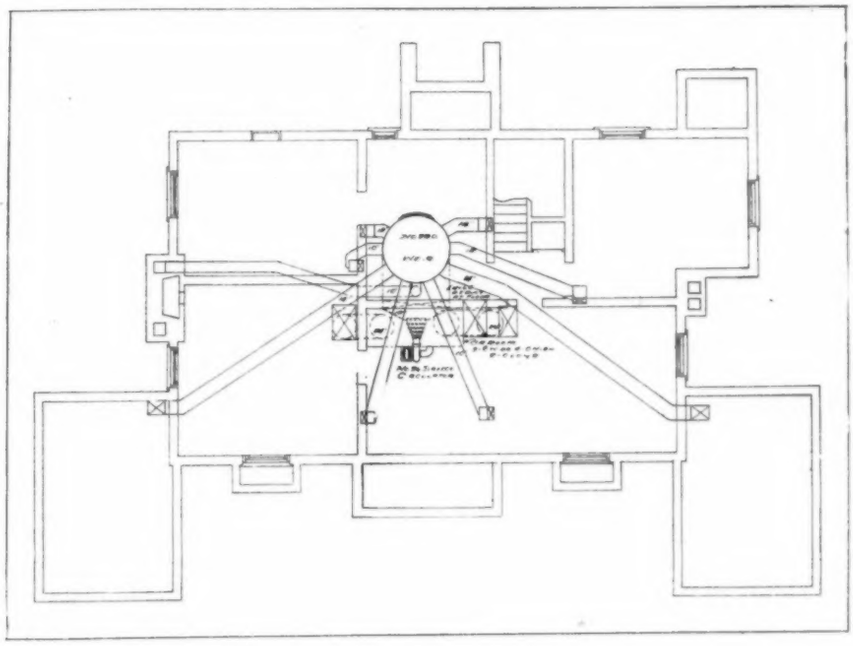
A New Edition of a Useful Book.

Just off the press and ready for distribution is a new edition of Hayes' Practical Exhaust and Blow Piping. It is a well written treatise on the planning and installing of fan piping in all its branches, with an appendix giving additional information as to special problems in blower work, hints on installing and estimating the cost of an exhaust system, with details of the construction of settling chambers for grinders. It can be had from the Book Department of AMERICAN ARTISAN

This Installation Is Planned in Accordance with the Rules of the New Standard Code.

A Small Circulating Fan Is Used in Connection With The Warm Air Furnace.

IN THE four accompanying illustrations are shown the installation plan for a warm air heating job in a two-story house. A small circulating fan is used in connection with this installation which was planned by the Engineering Department of the Meyer Furnace Company for the residence of Mr. Pageford, Peoria, Illinois.



Basement Plan for Furnace Installation, Designed by Meyer Furnace Company's Engineering Department.

The description of the plan follows:

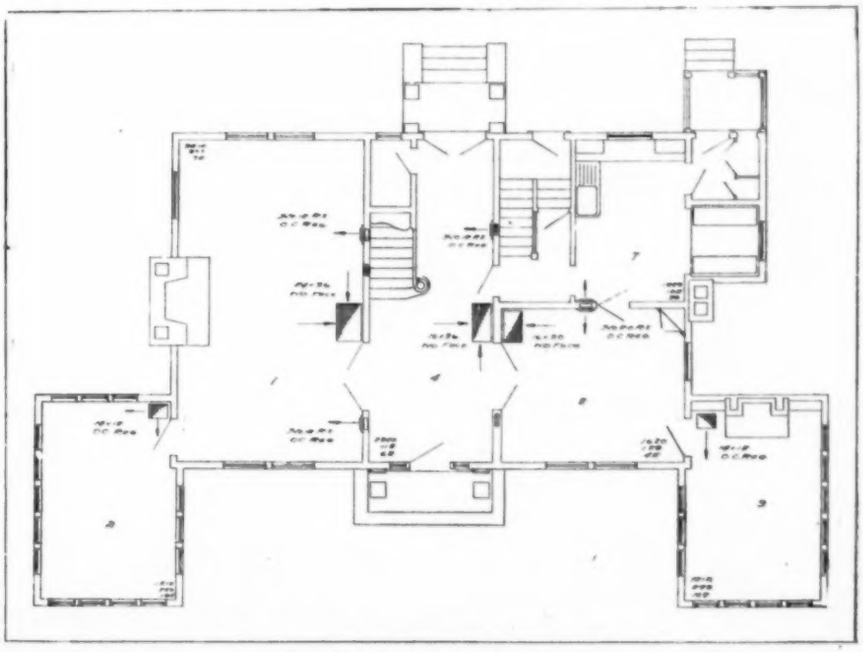
In planning this particular heating job, all details and dimensions furnished by architects have been carefully taken into consideration. The furnace has been located almost in the center of the building, and while this does not give a very short smoke travel, still we are of the opinion that with a good chimney this resistance can be easily overcome. By locating the furnace in this manner it was possible for us to get an even distribution of warm air outlets around the casing bonnet. It will be noted that all, with the exception of the pipes leading to the sun parlor and dining porch, are less than fifteen feet in length, thus giving a good rise to all basement leaders.

As it would be almost impossible to assure a positive delivery of warm air to the dining porch and the sun parlor on this job by a gravity system, we have specified the installation of a Number 36 Sirocco Circulator in connection with this heating system. This circulator will not only be a benefit in delivering a positive supply of warm air to the two rooms mentioned, but will also be of great value in speeding up the circulation throughout the house during cold morning periods when especially needed, and by operating this blower for a period of about an hour two or three times a day, we believe it will be possible to keep the temperature of this building to 70° in any weather.

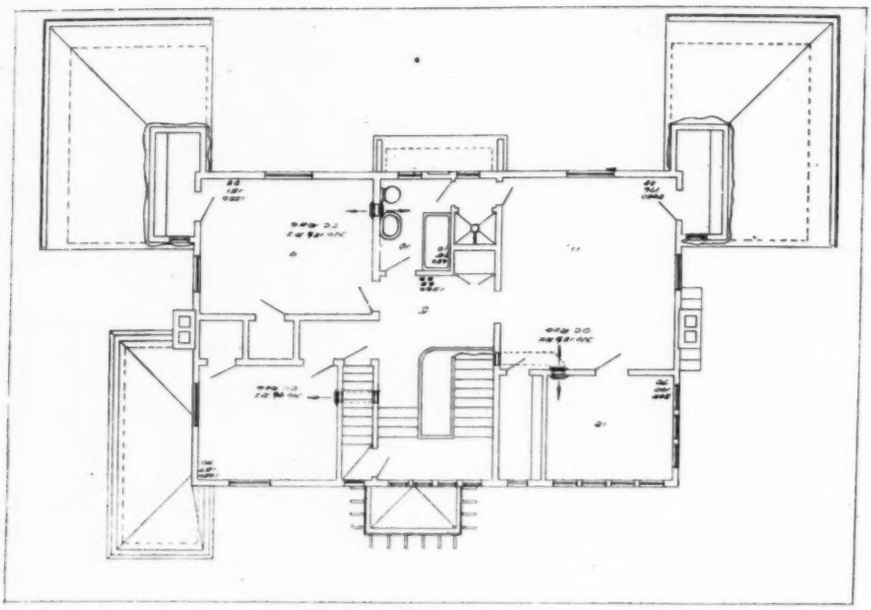
The pipe sizes have been calculated under gravity conditions in order that when the fan is not in use the system will continue to operate as a straight gravity system.

The Number 330 Weir Furnace specified on this job is guaranteed to deliver 1080 square inches of warm air area, and therefore it can readily be seen that the furnace will not need be forced, which, if done undoubtedly shortens the life of any furnace. The registers and return air faces specified on this job are also guaranteed to deliver and carry away more than the area of pipes leading to them.

It will be noted that the total warm air area delivered exceeds that required, in accordance with the Standard Code. It will also be noted that the return air area is also in excess of the warm air delivered.



Plan for First Floor.



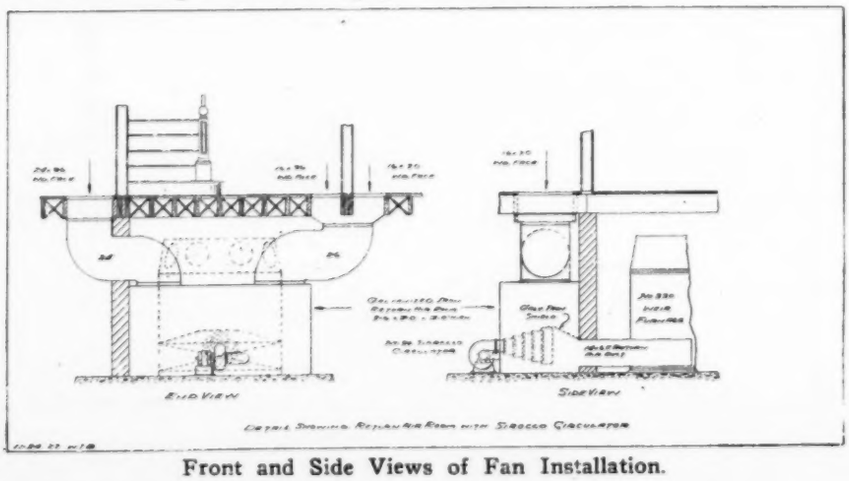
Plan for Second Floor.

When the fan is operating, these conditions will change accordingly.

The following schedule gives the exposures, pipe sizes required and pipe sizes, delivered:

Total returning air required, 957.
Total returning air delivered, 983.
Total warm air required, 943.
Total warm air delivered, 957.
The above pipe areas are figured in accordance with the standard Code Regulating the Installation of Warm Air Heating Furnaces in Residences.

	Exposures					
	Glass	Wall Surface	Cubical Contents	Warm Air Area Required		Warm Air Area Delivered
Living Room	75	377	3510	160		226
Sun Parlor	135	293	1512	163		154
Dining Porch	109	293	1512	146		154
Hall 1st Floor	62	118	2340	88		
Hall 2nd Floor	22	63	1530	31		154
Bedroom	30	157	1020	43		
Kitchen	30	105	1323	54		113
Dining Room	45	153	1620	76		
Bedroom	28	151	1530	47		78
Bath Room	10	75	680	21		
Bedroom	28	176	2040	55		78
Sleeping Porch	70	100	842	59		



Front and Side Views of Fan Installation.

Cash Sales Favored Over Installment Plan.

Furnace installers favor cash sales over installment payment methods almost unanimously. Here are the ways most of the installers replied as to their preference:

"Cash sales are the very best. No credit for mine."

"Ninety days is our limit."

"'A furnace always works better when paid for cash' is our motto, with few exceptions."

"I believe in cash sales always."

"We pay cash and get cash."

"We are opposed to long term credits. Too many worries and regrets! And it gradually works you into a class of business that is not profitable. Last, but not least, you encourage your customer to buy recklessly and carelessly which proves more expensive to him in the end."

"I have a sales contract of my own and find it very effective."

"I have never done any business on long time credit and don't want to."

"I have had no such experiences and do not want such. My rule is the quicker you collect for a furnace job the better satisfied the customer is. If you sell a good furnace and install it correctly you will have no trouble collecting cash."

"Long time credits will soon be a thing of the past. The buyer has to pay for it generally in inferior goods. We sell for cash, thirty days, and succeed."

"Long term credits mean short life of any business."

"Do not favor them. September datings are long enough. I never urge a sale without the knowledge of the customer's ability to pay. Heaters always work better when they are paid for."

Many other replies of a similar tenor were received. The question, as put, inquired as to the desirability of the long term credits being financed through the manufacturer. Many correspondents confessed they had no such experience to their credit. Others who commented somewhat differently from the foregoing were as follows:

"We finance our own sales but make no long time sales."

"We finance our own credits. I am not a supporter of a manufacturer carrying the credits of the consumer."

"Terms make many sales that would otherwise be lost."

"Have had no such experience. Have handled some accounts with a series of notes bearing interest."

"Have never put out goods this way. Have taken notes for [X—] Separators and turned them over to the company. Find it good system."

"I have had no experience. But what I know of it, I don't think it works in many cases."

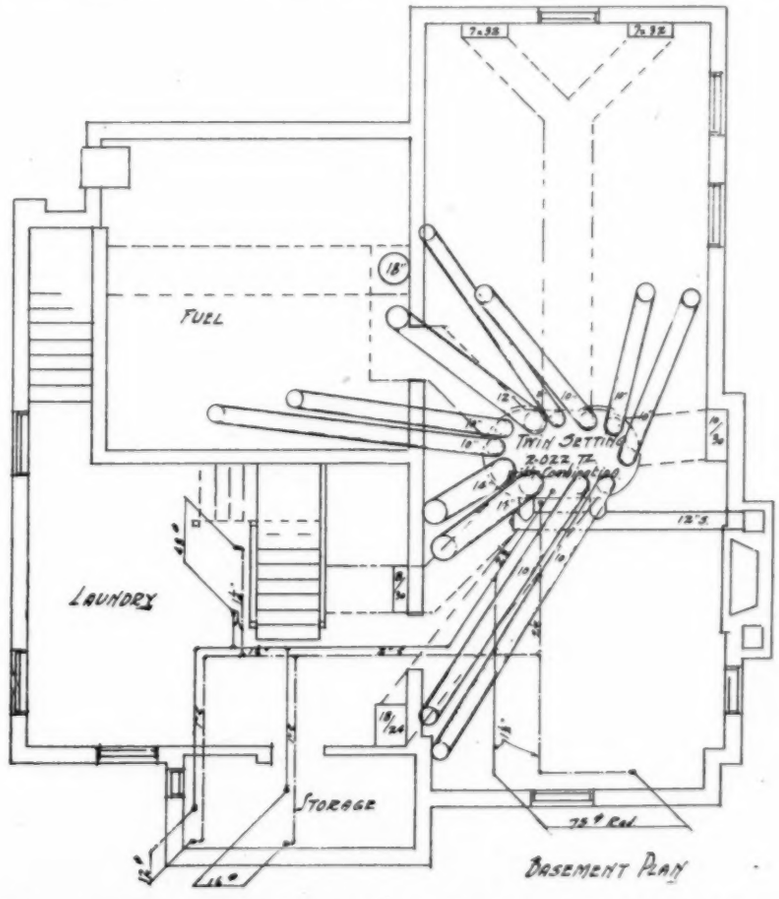
"Have never had any personal experience. An agent here using that system is getting fifty per cent of the business, whereas he should get twenty-five per cent, all other things being equal."

Twin Setting of Warm Air Furnaces With Several Unusual Features.

One Furnace Is Equipped with Holland Cast Fittings for Hot Water Radiation for Certain Rooms.

IN THE three accompanying illustrations are shown the installation plans for a twin setting of warm air furnaces which were set under the supervision of the Engineering Department of the Lennox Furnace Company, the explanation of same being furnished by A. O. Bishop of the company named, as follows:

"The Torrid Zone furnace has been installed in many kinds of settings and one of the latest is shown on the accompanying prints of an installation with two furnaces encased together which we choose to call our Twin Setting. One of these



Basement Plan for Installation of Twin Furnaces in Residence of Dr. H. A. Kinnan; Drawn by Engineering Department of Lennox Furnace Company, Marshalltown, Iowa.

furnaces is fitted with hollow cast sections to heat water for hot water radiation and supplies heat to those rooms that would be hard to heat with direct warm air.

"This installation was made in the new residence of Dr. H. A. Kinnan of Marshalltown under the supervision of our city and engineering departments.

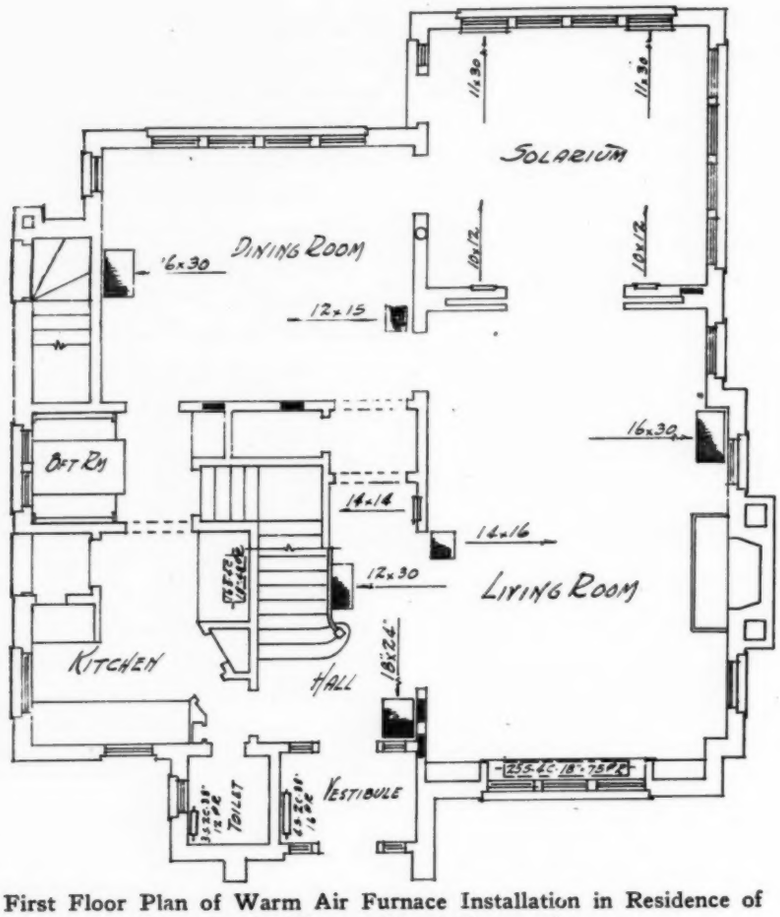
"The system is positive in every sense of the word and responds quickly to the fire. The Twin construction, though costing more than one larger furnace, has the advantage of greater radiating surface, double fire pot, economy of fuel consumption, and a saving of the life of the furnace construction. In mild weather one fire will care for the heat needed and on severe days the two furnaces will furnish ample heat without crowding either furnace.

"To supplement the warm air it was necessary to install hot water radiation in some of the rooms. The cast iron sections used in the Torrid Zone furnaces are very effective heaters and radiation can be provided for remote rooms at a very small cost of fuel.

"The combination installation of warm air and hot water is proving quite the favorite with owners of large homes and especially where garages are close to the house so that connection can be made to the heating plant.

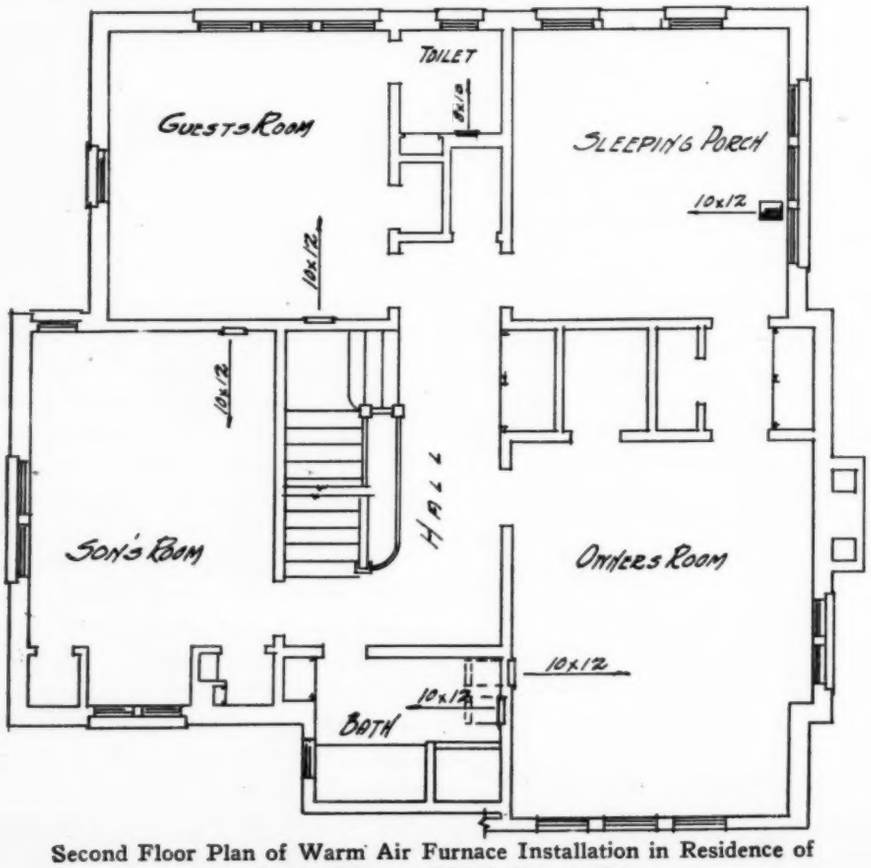
"In the installation for Dr. Kinnan you will notice by referring to the plans that a large volume of warm air is provided for each room rather than a small volume of air to be over-heated and an equal amount of return air is provided to make a well balanced and economical heating plant. To avoid running return air ducts through the basement the air is carried through underground pits built of cement. All joints in both warm and return air ducts are made tight so that no dust from the basement can enter the air circulation. No asbestos paper is used on either ducts or furnace casing.

"This installation is working fine



First Floor Plan of Warm Air Furnace Installation in Residence of Dr. H. A. Kinnan, Marshalltown, Iowa.

and proves what can be expected from good furnaces set in twin casing and also as a combination furnace."



Second Floor Plan of Warm Air Furnace Installation in Residence of Dr. H. A. Kinnan, Marshalltown, Iowa.

35,000 Chicago Chimneys Add to Smoke Problem.

"Clearer Skies Ahead" is the witty caption in the latest bulletin of the Chicago Department of Health, dealing with the city's anti-smoke crusade. A Smoke Abatement Commission has been formed of the city's most representative citizens and industries. This is gratifying to the department, which realizes, however, that education, rather than coercive measures, will do more to abate the evil in question. The *Bulletin* describes the situation in part as follows:

It is pretty well understood by those who have studied the problem of smoke abatement that while properly constructed boiler plants, stack capacity and intelligent stoking of furnaces are all important factors in smoke control, the kind and quality of fuel used also must be taken into consideration. As is well known, the coal situation in Chicago has been far from satisfactory for several years. As a result of the long drawn-out coal strike, followed by the strike of the railway employes, Chicago has been without a normal supply of fuel for many months. Especially has this been true as to the supply of the smokeless coals, which have been depended upon as the one important agency in reducing what may be termed domestic smoke production.

It is estimated that as a result of largely increased building operations in Chicago during the past two years, there now are not less than 35,000 flat and large apartment buildings, the chimneys of which are contributing much more than their full share to the city's smoke supply. But now with the fuel situation again approaching normal and thus providing the smokeless coals for domestic purposes, there is certain to be a marked improvement in this particular field.

But with improved conditions as to the domestic phase of the problem, there are still left approximately 20,000 industrial stacks,

many of which are continually emitting large quantities of smoke, which can and must be stopped.

Abolishing smoke in Chicago is not a one-man job. But with the people favoring and supporting the movement, its ultimate success is assured. Smoke belching from industrial plants may be a sign of activity, but it is also a streamer of waste. As one of the leading daily papers well puts it, "The best managed factories are the least smoky ones. They burn their coal instead of driving it away through the chimney to soil a neighbor's facade. A big factory cannot afford to waste coal. When it does so, it is because of neglect or inefficiency of an employe and is promptly corrected, if the management is awake."

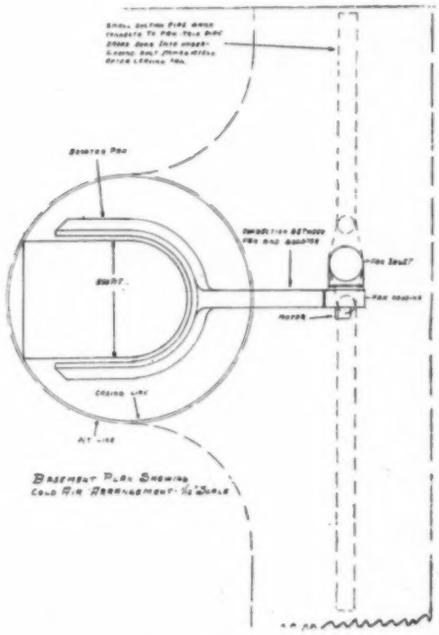
The same is true of the flat, house or small hotel owner. In other words, fuel waste means smoke production. Don't waste your fuel.

Six-Apartment Building Is Heated by One Warm Air Furnace with Fan Attachment.

Building Is Three Stories High and Each Apartment Has Its Own Warm and Cold Air Ducts.

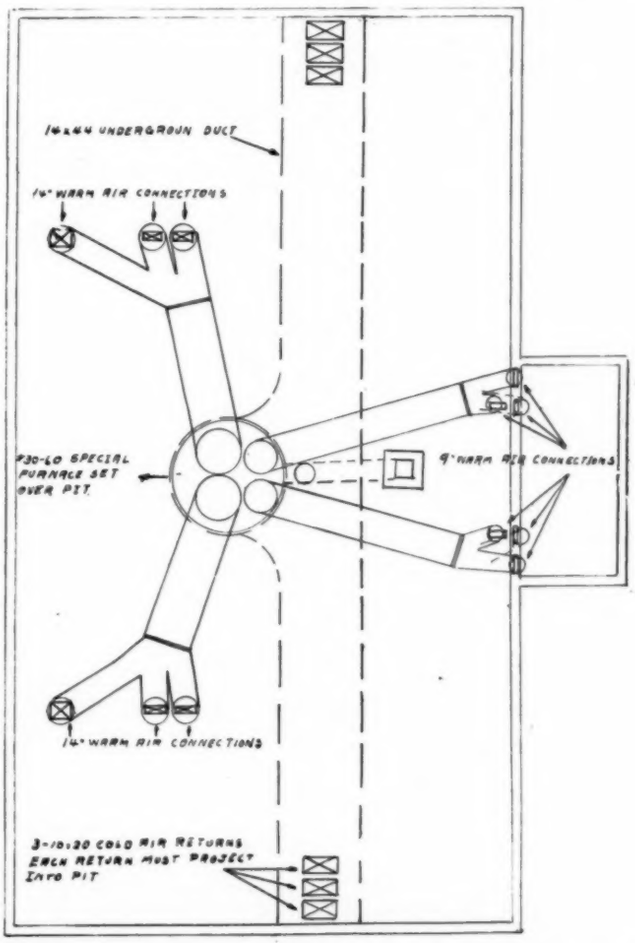
THE accompanying drawings illustrate a warm air furnace installation in a three story, six flat building. Each flat consists of six rooms, a sun parlor, living room, dining room, bedroom, kitchen and bath. These flats are equipped with In-a-door beds, which when in use, are located partly in bedroom and partly in living room, and when not in use fold back into a closet located between the kitchen and dining room. Care had to be used in laying this job out, so as not to destroy the privacy in any flat and at the same time install such a system as to obtain perfect recirculation of air.

The furnace used on this installation was a Number 30-60 Excelsior Special having a 30-inch oversized fire pot and a 60-inch galvanized tin and asbestos lined casing. The height of the basement permitted the warm air leaders to be taken off the top of the bonnet and these leaders consisted of two 24-inch and two 16-inch galvanized iron pipes. The

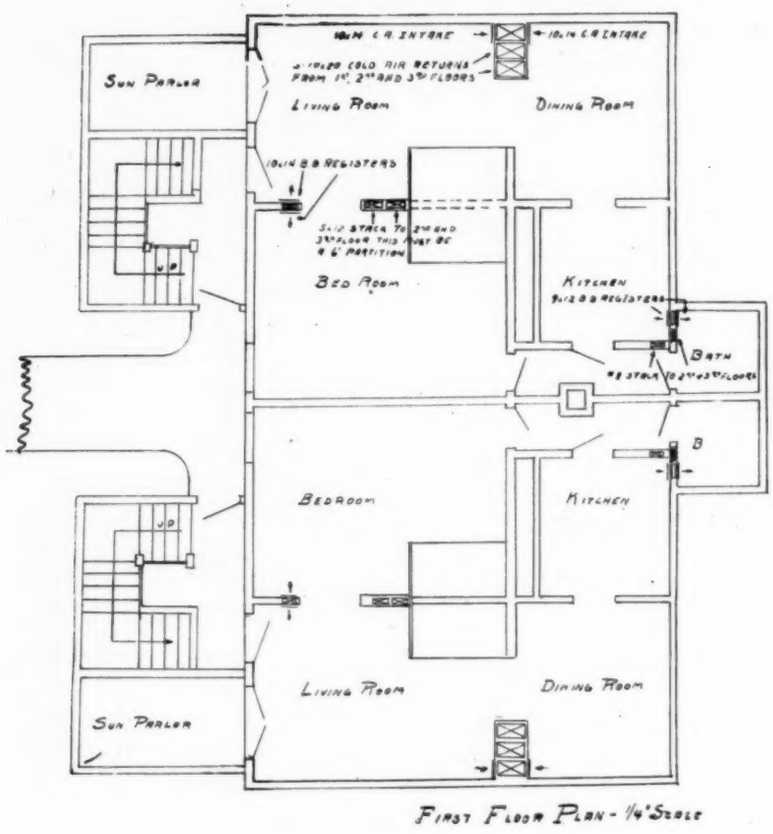


Layout of Booster

24-inch leaders are divided into three 14-inch leaders. One of the 14-inch leaders connects to a 10x14 Combination baseboard register and suplies heat to the bedroom and living room in the first floor apartments. The two remaining 14-inch leaders connect to two 5x12 double wall stacks, which connect to 10x12 Combination registers for heating the bedroom and living room in the second and third floor apartments. The 16-inch leaders are divided into three 9-inch leaders. One of these connects to a combination register for heating the kitchens and bathrooms of the first floor apartments. The remaining two 9-inch leaders connect to two 3x12 double wall stacks and with the use of two combination registers heat the kitchens


14x44 UNDERGROUN DUCT
14" WARM AIR CONNECTIONS
F30-60 SPECIAL FURNACE SET OVER PIT
9" WARM AIR CONNECTIONS
14" WARM AIR CONNECTIONS
3-10:20 COLD AIR RETURNS EACH RETURN MUST PROJECT INTO PIT

Basement Plan for Six-Flat Building. Designed by Excelsior Steel Furnace Company, Chicago.



First Floor Plan.

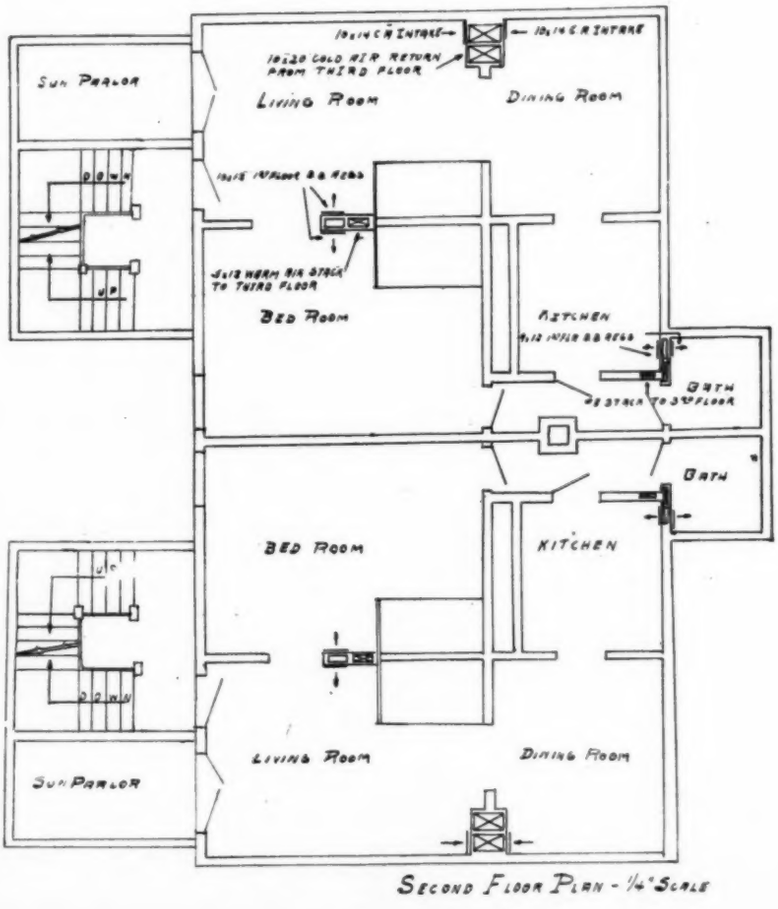
and bathrooms of the second and third floor apartments respectively. No provision for heating the sun parlor was provided for in the specifications.

Three 10x20 galvanized cold air stacks are installed in the partition between the living room and dining room for the cold air returns. Each apartment has a separate cold air return, which is equipped with two 10x14 cold air intakes located as shown. These six 10x20 cold air returns drop directly into the 14x44 underground cold air duct.

An Excelsior furnace booster, capable of supplying 120,000 cubic feet of air per hour was included in this installation. This Booster consists of a fan and motor which is located outside the furnace casing. The air supply to the fan is taken from the cold air duct through two suction pipes as shown on drawing. The air discharged from the fan is blown into the booster shoe, which fits around the ash-pit of the furnace, the air being discharged through a nozzle at the top of the booster shoe. With further reference to the booster will say that it will be necessary to operate the same only in the morning when a quick rise in temperature is desired or at such times as fire may have burned down to a low point. The average operating cost is approximately one-half cent per hour.

A special automatic humidifying apparatus has been recommended for the job, together with an air conditioning unit. The combination of the Excelsior booster, the automatic humidifying apparatus producing humidity of atomization of cold water instead of by evaporation, and the addition of the Ozone unit, which destroys odors and bacteria, produces an atmosphere that is superior to anything yet devised for the artificial heating of homes. Further mention of the use of these new devices will be made in AMERICAN ARTISAN at an early date.

In this building there is approximately 25,000 cubic feet of space to be heated, including 2,200 square feet of net wall exposure and 800



Second Floor Plan.

square feet of glass. Following the formula as adopted in the Furnace Code for computing warm air leading requirements, we divide the 25,000 cubic feet by 800, the 2,200 square feet by 40 and the 800 square feet by 12, adding these results together and multiplying them by the factor 9. This gives a total of 1,223 square inches of warm air leader area as against 1,304 square inches supplied. It will be noted on drawings that the cold air returns conform very closely to the warm air supply, assuring adequate circulation.

The installation of this job has opened up a new field for the use of warm air heating apparatus, which should greatly increase the use of warm air heating and its satisfactory and comfortable results assure a bright future for the industry.

Analyze your store, your stock, yourself and your men. Be sure the first three are above par, then concentrate on the fourth.

Be Sure to Get All Facts You Should Know About House That You Are Proposing to Heat.

Make Preliminary Plan While You Look Through Home and Ask Lots of Pertinent Questions.

SOME warm air furnace manufacturers make a practice of furnishing their dealer-installers with special forms on which to indicate the shape and room arrangement of homes where the installer is trying to make a sale. These forms are filled out and then sent to the Engineering Department of the manufacturer and plans for the installation are then marked out and drawn for the assistance of the installer who naturally stands a better show of making a sale when he can show the prospect something concrete as to how the plant is going to be installed.

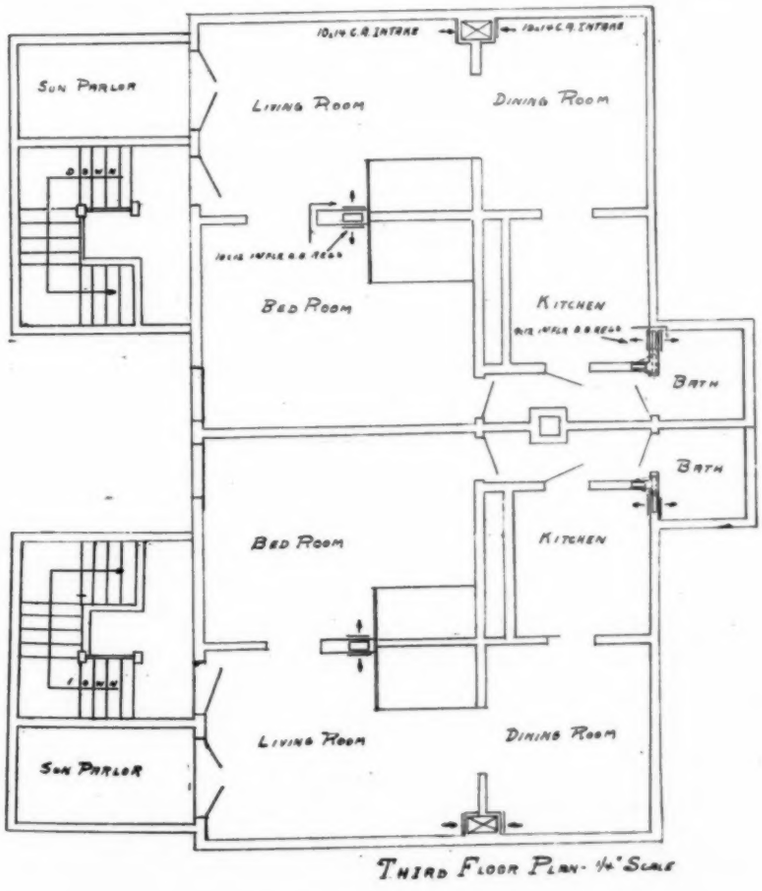
As a matter of fact, it is well worth while for every installer to have a set of forms which he may use in figuring on an installation, and so we show herewith a suggestion for a preliminary plan sheet, together with a list of questions to which the installers should make a special effort to obtain specific answers.

The questions are quoted from the information blank furnished by the Haynes-Langenberg Manufacturing Company, St. Louis. Their instructions and questions follow:

Mark shape of each floor in the ruled spaces allowing each square on the blank to equal one square foot of actual floor space. Show location of windows, doors, transoms, stairs and other openings which will have bearing on placing of registers. Mark rooms what they are: such as Living Room, Dining Room, etc. Show location of furnace flue.

Please Answer the Following Questions.

1. What is the size of the chimney, inside measurement?
2. Does chimney extend to basement?
3. Is there any other flue opening in furnace chimney?
4. What fuel will be used?
5. Does building stand alone, or is it protected by other buildings?
6. Of what material is house constructed?
7. Which is north? (Show on plan.)
8. Mark with X all rooms to be heated by furnace.
9. Is stair to second floor open or closed?
10. Does house have transoms over inside doors?
11. Give height and width of inside doors.
12. Is basement under entire house?
13. Are there girders or double joists in basement supporting inside walls (show on basement sketch by dotted lines).
14. If necessary to place furnace in pit (because cellar is not deep enough) would there be danger of seep water?



Third Floor Plan.

15. Specify ceiling heights and basement depth in space provided below.

The following special information is required for the heating of churches, schools, theatres, stores, etc:

Mark with X all spaces to be heated.

Is basement to be heated?

Is basement to be heated at same time auditorium is heated or alternately?

Is auditorium floor level or sloping?

What is extreme height of auditorium?

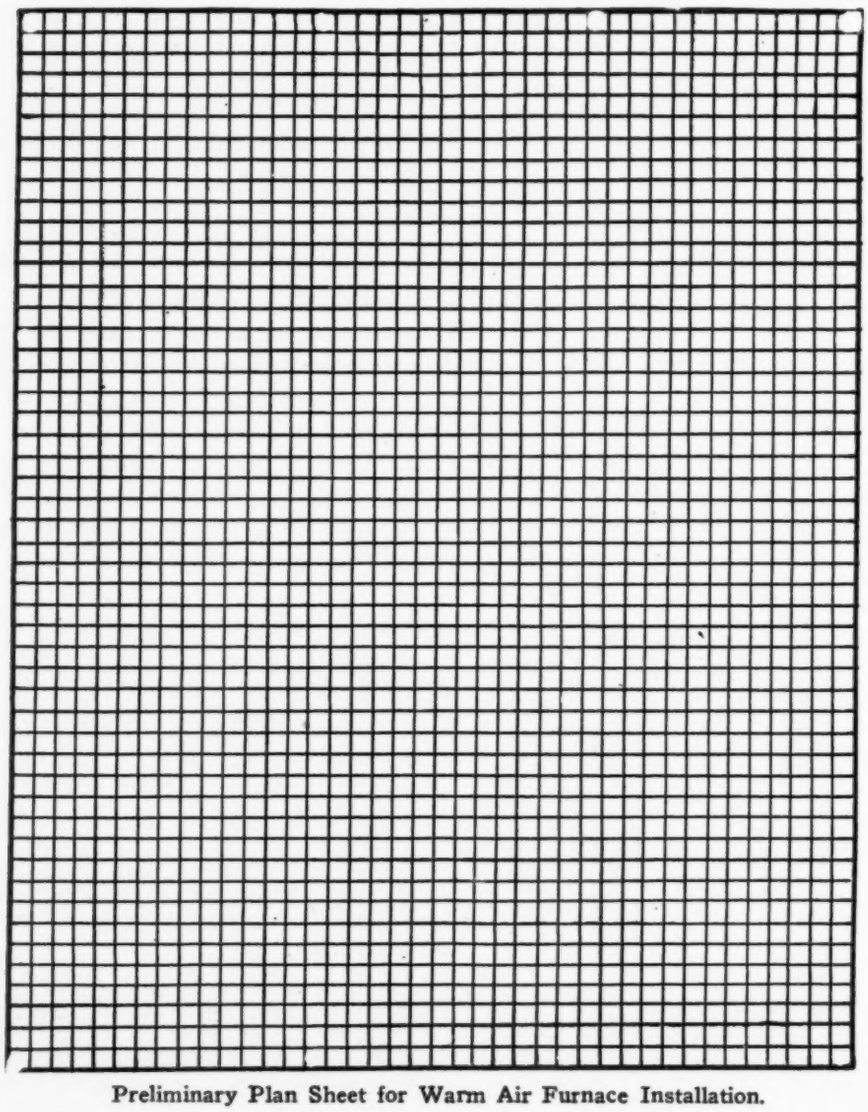
What is height of side walls?

Is ceiling flat or arched?

Is there a gallery in auditorium?

Show location of pulpit, aisles, also location and size of the flue.

Give height of all side rooms and state whether floors are level with auditorium floor.



Preliminary Plan Sheet for Warm Air Furnace Installation.

Jesse M. McHenry Writes at Random on Many and Various Warm Air Subjects.

He Says That Standard Installation Code Makes a Good Foundation on Which to Build.

WHEREVER warm air heating men gather there is always sure to be something doing if Jesse M. McHenry is among those present, for this same gentleman, with the name of a train robber, temperament of a man whom nothing ever excites and a manner of speaking which sort of "gets under the hide," knows a lot about warm air furnaces, their good qualities, the failures of the men who install them and the weaknesses of human nature which make the manufacturer feel unduly optimistic when it comes to rating his furnaces—and, last of all, —he likes to talk, and he also likes to see his writing in trade magazines like AMERICAN ARTISAN.

Knowing this latter peculiarity of Mr. McHenry, the Editor wrote to Mr. McHenry some time ago a courteous letter requesting that he prepare a "short" article on the advisability of using over-size furnaces rather than those which barely fill requirements, but received no indication that he had even seen the letter. Failing to find him in his office, a second request was mailed and here is what we received in reply—surely "Mac" is taking undue advantage, especially as he requires us to publish "all or nothing":

Your decree that I produce an article for the amusement of readers of the Annual Warm air Heater Special came mighty near embarrassing me.

You see, it's just this way: I agreed with myself a little while ago that I would refrain from speaking in public or writing for publication for a period of one year. That agreement was entered into some seven or eight months ago. In spite of some nearly irresistible temptations, I have during these past several months plodded along right in the middle of the straight and narrow path, looking neither to the right or left.

Your decree Number 1, ordering me to produce, was laid aside fully expecting that you would forget the whole blamed thing and that would end it and, as a result, my agreement with myself would remain inviolate. Only a few days after having, supposedly, disposed of the aforesaid decree, I sensed your presence in this neighborhood, whereupon I made a hasty retreat. I went into hiding after having instructed my trusted co-workers to report to you that I was absent from the city and would not return for several days. Not until I was reliably informed that you were

The NEW IDEA Pipeless Furnace
What the NEW IDEA really does
The SUPERIOR 1500 Warm Air Heater
SUPER-SMOKELESS
WARM AIR FURNACES

Four Pages from Selling Helps Booklet of the Utica Heater Company, Utica, New York.

headed back towards the Windy City did I find courage to come forth from my hiding place. When I did finally step out into the daylight again, I heaved a sigh of relief and patted myself on the back and says I to myself, "There, now, I have completely thwarted that confounded Editor's plans for once, any way."

I existed serenely and quietly for a couple of days thereafter in the thought that I had outwitted you; that state of exuberance, however, experienced a rude shock on the morning of the third day thereafter, when it was discovered that you had actually entered into a conspiracy with Uncle Sam who delivered to me that morning decree Number 2. This last strategic move of yours and Uncle Sam's completely flabbergasted me and left me without any visible means of escape. Another hurried conference between I and myself was called, during the course of which says I to myself, "Here we are between the Devil and the deep sea—a dogged persistent editor on one side, and a perfectly honorable agreement between me and myself on the other, which way shall we jump?"

Characteristic of the party to the aforesaid agreement, it was unanimously agreed that the most sensible thing to do was to follow the line of least resistance and here I am, traveling along in that direction.

There is one comforting thought, Mr. Editor, and I believe that I shall stop right here and tell you about it. On that agreement which existed between me and myself up to thirty minutes ago, I attained an efficiency of at least seven-twelfths per cent, and that, you will agree, is quite remarkable for one who has followed the heating business so closely as I have followed it for more than a quarter of a century.

Now listen, Friend Editor, what in the mischief ever induced you to order me to write on a defined subject? Don't you know that I am devoid of all literary talent and that I have never had training along literary lines? Don't yon know me well enough to realize that it would be impossible for me to write more than a dozen logical sentences on any sort of a fixed subject? Surely, under these circumstances you will grant me the privilege of writing as I please, at random—as it were. By the way—it occurs to me that a good subject for this effort, if a subject is desired, would be "At Random."

I rather enjoy talking about the latest things out, and to write about them, too, when I am arbitrarily commanded to write. The newest thing out in the heating world, is the national Installation Code, and I am going to exercise the privilege of saying a word about it.

Suggestions for Retail Advertisements, from Waterman-Waterbury Company, Minneapolis, Minnesota.

The organizations sponsoring this new Code and assuming responsibility for its existence, make no claims that it is a perfectly finished product, but assert that it is the best compromise that could be effected between the various elements represented in its development. It is not to be pretended that the instrument is perfect or that it represents all the hopes and wishes of any one person or groups of persons. It is, as was the Federal Constitution, and as all such measures must be, the result of compromises.

I contend, Friend Editor, that no one can justify oneself in approaching the consideration of the Code with the mind to compare it with one's own ideal. That attitude would, in all probability, mean its condemnation in advance. Nor should it be objected to because some desired provisions may not be found within its scope. The real and only question at this stage of the game is: "Is this Code as it is now framed, a good foundation on which to build a greater one?" Looking at it from this angle, it seems to me that no fair or impartial minded man can think other than favorably of it.

Although I had a minor part in the development of the Code, I am frank to admit that I am not altogether satisfied with some of its provisions. I may, as a matter of fact, offer constructive criticism, a privilege which I trust many will exercise.

Now, Mr. Editor, it was your peremptory command, that I write to the subject "Why Should Installers Use Larger Furnaces?" or something like that.

In Every Corner of the House
INTERNATIONAL ONEPIPE HEATER
(YOUR NAME HERE)
One register
One pipe
One hole to cut in the floor
For Old Homes New Homes Churches Stores Small Theatres
Furnaces that stand the Test of Time
INTERNATIONAL Carton Furnaces
(YOUR NAME HERE)
INTERNATIONAL ONEPIPE HEATER
How Heat Comfort is Assured
INTERNATIONAL Barnnet Warm Air Furnace
(YOUR NAME HERE)

Retail Advertisements from Selling Helps Booklet of International Heater Company, Utica, New York.

Had you left out that word "why," my task would be finished, I would simply say "yes" and let it go at that, but darn the luck, you started the thing with that little insignificant word of three letters and I am now racking the little brains that I possess trying to think up some way to upset it.

Well, at any rate, I may as well start by saying that every one who may have investigated or given careful thought to this question knows that furnaces of generous capacity—which is only another way of putting it—should be used. How do they know it? That's easy! They know it because of the sad experiences realized by themselves or others who suffer the consequences accompanying the use of heating units possessing capacities inadequate to the needs. They know of the resultant discomforts, the excessive fuel consumption, the expenses for repairs or replacements, and the annoyances incidental thereto.

I am safe in asserting, my dear Sir, that at least seventy-five per cent of the furnaces installed in your City of Chicago and in my own City of St. Louis and many other localities with which I am familiar, are altogether too limited in their heating power or capacity, to perform the function for which they are provided, on an economical or satisfactory basis.

Should you or any of the readers of your periodical doubt the accuracy of this assertion, let them or yourself come to St. Louis, and I will take a day off and demonstrate the fact as stated. Practices other than the use of heating units, lacking in quality and heating power, conspire to discredit the warm air heating system in the estimation of the public, but these are factors of which I am not privileged to write at this time.

Large heaters or those having capacities in excess of the maximum demands likely to be exacted should be used, because there is involved the vital interest and welfare of the home or property owner who invests in the system. The installer's

Four Pages from Booklet of The Wise Furnace Company, Akron, Ohio.

Movie Slides Furnished by Haynes-Langenberg Manufacturing Company, St. Louis, Missouri.

good-will or reputation is enhanced or otherwise affected by the performance of the heating systems he plans and installs. It is chiefly through the use of heating units with capacities to meet all demands economically and satisfactorily that a good reputation for the warm air heating system is to be established and maintained.

There now, following a lot of preliminary stuff the subject assigned to me has been disposed of in four brief paragraphs, but I can't stop here because there arises in logical sequence the question as to how installers, at least a good portion of them, are to know whether or not the heating units which they use actually possess the required capacity. The new Code offers no real help in that direction. The method of determining size of furnaces as recommended in Section 9 of the Code is the weakest part of the entire instrument.

The size of a casing in its relation to the heatnng unit or in other words, the free area through the casing is not a safe basis on which to estimate the heating capacity of any furnace.

If that were true we would, all of us, start at once to remodel our heaters and put larger casings on them.

This section is fallacious. It should not, in my judgment, have been incorporated in the Code, as it adds nothing whatever of value to it.

In the absence of the suggestion of any more practical method for determining the furnace requirements, I offered, as a member of the Joint Committee ,the following as a substitute for Section 9:

"The grate areas of furnaces for heating systems shall equal 60% of the area of warm air pipe or pipes as arrived at by the use of the pipe area rules of the Code. The area of grates to be considered equal to the area of the firepot at the plane of its shortest diameter."

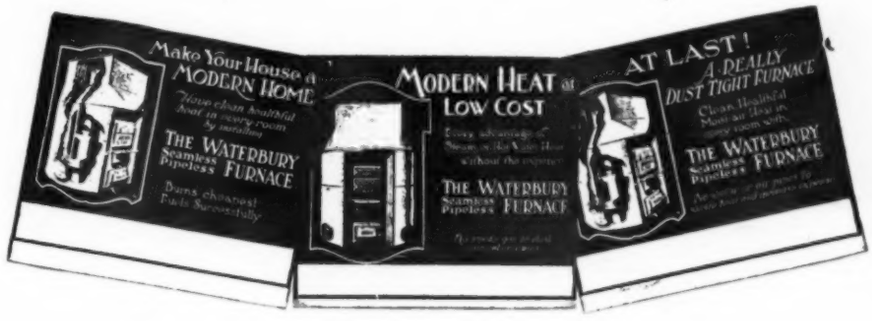
In common with others who have expressed themselves, you probably will say that grates do not constitute a reliable basis for capacity ratings. You can't get an argument out of me on that score, for I at once agree with you. Nevertheless, the performance of standard types of furnaces having grate areas equalling 60% of the area of warm air pipes of well designed and properly installed systems will continuously for an indefinite term of years, satisfy the owner. And to satisfy the owner is a factor of supreme importance.

With the possible exception of instances where extra large furnaces, those having firepots 30 inches or more in diameter, are used, I defy anyone to come forward with evidence that will successfully discredit my contention.

The dealer who installs heating systems in accordance with the National Code and uses standard pipes of furnaces having grate areas equal to 60% of the warm air pipe areas will establish a good-will for himself and will derive a degree of pleasure and profit to adequately compensate for time and effort expended.

Now, my dear Editor, I shall not need to remind you that I am rather dogmatic in some of my statements. You will have discovered that fact. I may remind you, however, in closing, that one writing at random, as I have, against time and space, finds it necessary to concisely state the facts as one sees them.

With this I close, wishing you and the entire AMERICAN ARTISAN Staff, together with all of its readers, a very Happy and Prosperous New Year.


Make Your House a MODERN HOME
THE WATERBURY Seamless Pipeless FURNACE
MODERN HEAT at LOW COST
THE WATERBURY Seamless Pipeless FURNACE
AT LAST!
A REALLY DUST TIGHT FURNACE
THE WATERBURY Seamless Pipeless FURNACE

Movie Slides Furnished by Waterman-Waterbury Company, Minneapolis, Minnesota.

Movie Slides Furnished by International Heater Company, Utica, New York.

Best Heating Installation Likely to Fail If Chimney and Draft Construction Are Faulty.

W. Gunton of R. J. Schwab & Sons Company Explains Ideal Flue and Gives Valuable Hints to Installer.

THE important relations of chimneys and draft to proper heating installation form the subject of this special contribution to AMERICAN ARTISAN AND HARDWARE RECORD's "Warm Air Heater Special," prepared by W. Gunton, engineering department, R. J. Schwab & Sons Company. The technical information, together with the practical suggestions in this article, make of it a valuable addition to the installer's knowledge. It follows:

All heating men know and agree that a heating plant of any kind is no better than the chimney to which it is connected.

The value of any flue as a carrier of heated gases depends upon both velocity and transverse area and it is not only necessary that a chimney have sufficient height to produce draft but that it must have an area capable of carrying the total volume of the gases. The height may be sufficient to create a good velocity but the area may not be sufficient to carry the volume of gases required and the draft becomes ineffective because of clogging.

On the other hand, the draft may become ineffective from reduced velocity due to too large an area. In any chimney, height and area are dependent variables. The height is first determined to give a certain draft and to agree with surrounding building conditions, after which the area is determined to carry the gases at the given height and resulting gas velocity.

The idea seems to be carried by most users of heating plants that the method of testing the draft in a chimney is by inserting a piece of lighted paper in either the smoke pipe or the chimney, if the paper burns quite readily they insist that the draft is good and that the chimney is sufficient for the heating plant. This test has no meaning whatever, as a flue of almost any size would be capable of carrying the amount of gases produced by the combustion of the paper. However, no test would be of any value, unless it takes into consideration the volume of gases produced by the combustion of the amount of fuel consumed by the heating plant, this amount to be based on the grate area of the furnace or boiler.

W. Gunton.

Combustion as used by heating engineers signifies a rapid chemical combination between oxygen and the carbon, hydrogen and sulphur comprising the various fuels. This combination takes place usually at high temperature with the evolution of light and heat.

The substance combining with the oxygen is known as the combustible, and if it is completely burned or oxidized the combustion is perfect, that is, no more oxygen can be taken up by the products of the reaction.

The combustion is imperfect or incomplete when carbon burns to carbon monoxide instead of carbon dioxide. Since the former may be further burned to form carbon dioxide if the necessary oxygen is supplied. Each combustion element in the fuel will unite with a definite amount of oxygen. With the ultimate analysis of the fuel known, the theoretical amount of air required for combustion may be calculated.

When as is ordinarily the case, the oxygen is obtained from the air, the nitrogen of the air passes into the furnace with the oxygen. It takes no part in the combustion, but passes through the furnace and up the chimney with the carbon dioxide without any change in its nature; it is, however, usually called a product of combustion in air.

Carbon dioxide is composed by weight of twelve parts of carbon and thirty-two parts of oxygen. Hence, to burn a pound of carbon requires two and two-thirds pounds of oxygen. If the oxygen is taken from the air, which contains only twenty-three per cent of oxygen, it will take eleven and six-tenths pounds or approximately one hundred fifty-five cubic feet of air and as carbon is the principal element in ordinary fuel, it can readily be seen that it requires a considerable amount of air for the proper combustion of one pound of fuel. This is variously estimated at between ten and twelve pounds, or from one hundred and forty to one hundred and sixty cubic feet, basing our figures on a combustion rate of four and one-half pounds of fuel per square foot of grate area. The average grate area for a twenty-four inch furnace is two and three-quarters square feet. Thus assuming that the heater would consume approximately twelve and one-half pounds of fuel per hour. The amount of air necessary for the proper combustion of this fuel would be approximately two thousand cubic feet per hour. The calculations for air required presuppose that each and every particle of oxygen can be brought into intimate contact with the combustible. Practically this is impossible, due to the large amount of inert nitrogen pres-

ent, variations in the fuel bed and interference of clinker and ash, which cannot be removed as soon as formed.

It is therefore necessary to provide an excess of air when burning coal under either natural or forced draft, amounting to approximately fifty to one hundred per cent of the net calculated amount. This amount of air would be passed up the chimney as products of combustion. From these few figures showing the volume of gases which it is necessary for the chimney to handle as a result of the combustion of coal, it can readily be seen that area and velocity are factors to be considered in arriving at the proper size of chimney for any heating plant.

The height is the primary factor in creating velocity, but the form of the flue and the construction and the kind of materials also affect the velocity.

The manufacturer of furnaces and boilers can guarantee a stated rating of his products only if the draft and capacity of the chimney is right, and the heating contractor has every right and in justice to himself must insist that a good chimney, sufficient to furnish a proper draft, and should write such a clause into his contract, as a condition of his guaranteeing any installation.

The ideal chimney flue is round in section, though the rectangular shape is most used. These should be kept as nearly square as possible. A chimney should be built up of hard burned bricks, well bedded in cement mortar, with all joints struck smooth. Lime cement brick or cement or concrete block chimneys are too porous to make a really good chimney. A tile lined chimney properly constructed is good and if used the brick should be laid up around the tile after it is set in place and cement should be slushed between the tile and the brick.

Chimneys under thirty feet in height are unreliable in their action, some engineers recommending nothing under forty feet. If the top of a chimney is below any nearby portion of the building and sometimes neighboring structures, eddy currents will be formed, which will seriously reduce the draft.

Chimneys on outside walls, while sometimes adding to the artistic appearance of a house, are not as satisfactory, due to the contact with the cold outside air, as a chimney going through the inside of a house. When an outside chimney is built, it should be made double walled, with an air space between the walls.

In most cases all of the evils resulting from an inefficient chimney are first blamed to the heater and heating contractor. If it is in his power to insist that the code for chimney construction such as formulated by the National Board of Fire Underwriters be followed, this code having recently been approved by the National Warm Air Heating & Ventilating Association, National Association Sheet Metal Contractors and Western Warm Air & Furnace Supply Association, he will be protecting himself and doing his customer a real favor as well. As in many cases it is ignorance as to what comprises a good chimney rather than anything else that causes an owner to allow a poor chimney to be built, and if he is impressed in advance with the necessity of following certain definite specifications in order to insure his heating plant of a good chimney he will do so.

The heating contractor will do well to bear this in mind and sell his customer on the value of good chimneys at the same time that he is selling them the heating installation, and his conscientiousness in this regard will reflect to his benefit and be an assistance, rather than a hindrance, in selling the heating plant itself.

Make Installation First Consideration and Expense Secondary, Declares Manufacturer.

Head of American Furnace Company Sees Way To Increase Sales and Recover Lost Business.

CHEAP installation should be sold as such, says H. V. Bayse, president of the American Furnace Company. But the right kind of furnace, properly installed, can be sold to compete with any steam or hot water installation, and it is up to the installer to educate the householder just what are the advantages of warm air heating, continues Mr. Bayse. His special message is as follows:

The other day a furnace contractor asked me what I thought of the Standard Code, regulating the installation of warm air furnaces. I told him that my thirty-three years of continuous experience in this business, with the advantage of calling on furnace dealers from St. Louis to the East Coast once each year for twenty-seven years and to the Pacific Coast for twenty-two years, naturally has placed me in position to know more or less about the subject and that I consider the Code to be a grat deal more important than many heating men supposed it to be, that if it were adhered to, it would positively increase furnace sales and enable us to creep back into heating the better class of houses, which we have driven into hot water heating not only by the use of cheap faulty furnaces, but by not properly installing the better grade of furnaces as well.

We must resort to better furnace heating at any apparent cost. We must come to our senses. The real problem is this: you had better lose a furnace job by being high than lose it to hot water later by reason of a cheap and improper installation.

It has been demonstrated that the public will not stand for the cheap faulty furnace or installation. It is plain to see the loss of our business to the hot water and steam man, which is simply the result of faulty furnaces.

The furnace has every advantage over hot water or steam in a house,

say, of twelve rooms and smaller. It is a fact that can be proven either by argument or demonstration. It is now up to us to demonstrate the fact and we can and must do so.

I am not criticizing the Code for the reason it has too much good for criticism, but would call attention to a point which I believe could have been made more specific, and that is in relation to proper air supply.

Several years ago we had three to five open grates or fireplaces in a seven-room house. Those fireplaces enabled us to take air from the outside, they provided ventilation as well as proper circulation for outside air supply. We now find the average small house has omitted the fireplace, or possibly has one in the living room which has made it impractical for outside air supply. In such cases the air supply should be taken from the interior of the house, first floor; also I would advise that in keeping with gravity heating that the cold air pipe have a gradual fall from the cold air face all the way to the furnace and under no circumstances permit a level run, such as boxing below the joists for return air supply; also that return air pipe should be constructed so as not to permit any cellar dust to enter the installation from that source.

Now, fellows, let us all get together and improve the situation. We all look around and see the small house installing hot water or steam; we hear them "knock" the furnace. Let us not pass the "buck" to the manufacturer or to the installer, we are all to blame for the present condition of affairs. Let us make this rule, each of us to sell the cheap furnace or installation with an apology, not offer the cheap furnace as the best nor a good furnace with a cheap installation as the best.

H. V. Bayse.

Be fair and honest. Do business like the piano man—all pianos are guaranteed to make music—all furnaces are guaranteed to heat.

Have a good line to offer for the reason it is your duty to give your customer an opportunity to buy good goods and explain to him when he buys too cheap, not to condemn furnace heating until he pays a price for the right kind of furnace properly installed. In other words, pass the "buck" where it belongs—to the purchaser of cheap, faulty furnace installation.

There are times when a salesman should not act without getting instructions from the boss, but there are times, too, when to wait for instructions is to lose the opportunity.

Chicago Daily Tribune Stresses Importance of Proper Firing.

Reference has been made by us on many occasions to the importance of improving methods of firing residence furnaces, both from a fuel saving standpoint and from that of avoiding preventable air pollution.

Installers of warm air furnace can render a highly valued service to their customers as well as to their community at large by making it a point to instruct them in proper methods of firing.

That the public is already interested, to a certain degree at least, is evident from the fact that important papers, like the *Chicago Daily Tribune* deem it worth while to devote space not only in its news columns, but even among its editorials, to the discussion of this subject, as for example the following editorial which appeared Thursday, November 23rd:

Burn the Smoke.

"A new anti-smoke campaign in Chicago has been launched by Health Commissioner Bundesen. He has organized a smoke abatement commission designed to reduce the evil. H. W. Evans, chairman of the commission, says the annual loss directly attributable to the smoke evil in Chicago is $20,000,000. That should be sufficient, even without the evidence constantly before our eyes, to fix public attention on the evil and win support for any movement which promises to reduce it.

"Frankly, however, though we have full sympathy with the effort, who do not expect to see Chicago restored promptly to pristine cleanliness through the new commission. It may help. We hope it does. But at best it cannot do one-tenth of one-hundredth part of what the citizens of Chicago could do without such a commission if they were willing or intelligent enough to do the obvious things.

"Smoke is largely due to carelessness or ignorance. It is due to improper combustion of fuel. Thus gases, soot, and various combustibles are carried into the air to lodge

on buildings, on white collars, on carpets and hangings, and in lungs and nostrils. Every bit of smoke released to do such damage is evidence of waste. Properly built furnaces and proper building and stoking of fires will save perhaps half the coal bill due to poor furnaces and unintelligent firing. At the same time they could save probably more than half of the $20,000,000 now estimated as the annual damage due to smoke in Chicago.

"Intelligent factory managers know this. The best managed factories are the least smoky ones. They burn their coal instead of driving it away through the chimney to soil a neighbor's facade. A big factory cannot afford to waste coal. When it does so it is because of neglect or inefficiency of an employe and is promptly corrected if the management is awake. How, then, can a small house or flat owner afford to waste his fuel at the present high prices? He cannot. A little study and a little supervision of janitors will show the way to savings which will be immense in the aggregate.

"A cleaner and more healthful and more prosperous city can result from such efforts. There is a field for the new smoke abatement commission."

Many Manufacturers and Nearly All Installers Favor Uniform Laws for Warm Air Heating Installations.

But Opinion Is More Divided As to Wisdom of Having States License Installers, Reports Show.

GENERALLY speaking, the furnace manufacturers of the country, as interviewed by AMERICAN ARTISAN AND HARDWARE RECORD, are in favor of uniform legislation on warm air heater installations, but there is a marked division of opinion as to the advisability of having the several states license the installers of warm air heaters. The installers, however, are almost unanimous for uniform laws, and most of them favor the state license plan.

The replies to the questions put to the manufacturers on these two subjects indicate a careful reflection on the part of makers, and a tendency to leave nothing undone to promote the industry. The questions were put as follows:

(*a*)*Do you approve of uniform legislation throughout the country governing the details of Warm Air Heater installation?*

(*b*) *As a logical corollary of such laws, do you approve the licensing of Warm Air Heater installers by the State?*

Some of the replies and the comment evoked are as follows:

"(a) Yes, if reasonable. (b) It would benefit the business if politics could be avoided."

"(a) Yes. (b) No."

"(a) Yes. (b) Under certain conditions only."

"(a) Yes. (b) Might be a good plan."

"(a) Yes. (b) Not so sure about this."

"(a) Yes. (b) No."

"(a) Yes, if it could be done O. K., but it is impractical. (b) Would be too much crookedness."

"(a) No. (b) No."

"(a) Yes. (b) Yes."

"(a) Yes. (b) I do not favor a license but I do favor legislation which will compel installations according to a certain standard with inspection to see that it is done."

"(a) Yes. (b) Yes."

"(a) Yes. (b) Yes."

"(a) No. (b) No."

"(a) No. (b) No."

"(a) No. (b) Yes."

"(a) No. (b) No."

"(a) Yes, though different localities require larger or smaller furnaces and pipes and registers. (b) Not until educational work amongst installers warrants such action."

"(a) Yes. (b) Yes."

"(a) Yes. (b) Yes."

"(a) Yes, if the legislation is intelligently done. (b) No."

"(a) Yes. (b) Yes."

"(a) If right. (b) No."

"(a) Yes. (b) Yes."

"(a) Doubt the advisability of any legislation—too much regulation now and too much of it ill advised. (b) No. We believe in freedom."

"(a) Most assuredly, if any legislation is necessary. Generally speaking, there is too much legislation. (b) No objection to it, but there are many very sensible practical men that could pass no kind of examination requiring clear writing."

"(a) No. (b) No."

"(a) So long as politics would enter into the legislation concerning warm air heating, I would not be in favor of same. (b) We do not believe in licensing warm air installers."

"(a) In so far as regulation relating to safety and the mechanical features of installation, could well be uniform. Those relating to sizes must be based on the heat loss and would vary with climatic conditions. It depends on how these were drawn, whether such regulation could be more uniform. (b) Yes."

"(a) We do. (b) Yes."

"(a) Most emphatically no. (b) No."

"(a) Yes. (b) Yes."

Installers Strong for Uniform Laws and Majority Favor State License Plan.

Turning now to the warm air heater installer we find a more unanimity of opinion on these questions. The inquiry was put to the

trade in a slightly different form, as follows:

(*a*) *Is it a good thing for the trade in general to have state laws controlling the installation of warm air heaters?*

(*b*) *Do you think that installers should be licensed by the State, thus excluding unskilled people who make warm air heaters merely a side line to some other business.*

More than a score of installers answered the two questions with a blunt "Yes" as against two or three negatives. More is to be gleaned, however, from the comment evoked, by the inquiries, of which the following are characteristic:

"(a) I believe it would be a good thing for the trade. (b) I do think that installers should be licensed."

"(a) Yes, if a man with brains that knows something about warm air furnaces can draw the law. (b) Yes."

"(a) I believe in the Constitution of our Government. If one buys from an incompetent dealer that's his fault. He won't do it the second time in order to save a few dollars. (b) I think the above answers this question." (a) Yes, by all means. The Handy Man, and Tom, Dick and Harry should be put out of business, and the Cheap John Furnace Manufacturer, as a sideline, should also be prevented from flooding the markets with his trash to the detriment of legitimate trade. (b) Above item answers my opinion on this very important as well as aggravating question, as the Cheap John Manufacturers and the consequent Handy Man have just about put a black eye on the honest and legitimate furnace business."

"(a) Do not think so. (b) Let 'em go, they will soon get enough."

"(a) Yes, and there ought to be some law that would make these mushroom manufacturers that spring up now and then submit their furnaces to at least a two winters' test in the North. (b) Yes, we would consider such a law when strictly enforced a very good thing. As it is now, whenever someone thinks of some freak looking stove which they think would make a good furnace, they have a few made and put them on the public and call them furnaces."

"(a) I do not think it necessary. (b) Not necessary here."

"(a) Laws are all right at the right time and in the right place but it looks to me like the law has its hands full now. (b) I think that for license we have enough to pay now."

"(a) By all means. Too many are put in by persons that know nothing about them and then condemn the furnace. (b) Yes."

"(a) If it could be conducted on a proper basis and without petty graft it would be all right. (b) Manufacturers are not always installers, so this question or answer could be misconstrued."

"(a) Yes, if a first class man is in charge. (b) Yes, if properly handled, which is impossible."

"(a) Not any advantage. (b) No, too much red tape in the state now."

"(a) This question must be looked at from a point of view of both sides; whereas, it might be all right in some cases, in others, ofttimes, it would not be. We find persons not licensed to do a certain class of work know more about it than one licensed. (b) No, to be candid, I don't."

"(a) It might be if the drafters of the law were familiar with warm air heating. (b) If it could be accomplished without abuse of power."

"(a) Yes, it would cut out this bad work. (b) Yes, it would be better for the furnace trade."

"(a) Yes. Then every furniture dealer, butcher and groceryman or handy man in small towns would not be butting into the trade. (b) Yes, by all means."

"(a) This is the only way the heating men will be able to get better heating systems installed, as it will keep out all the good-for-nothing heating men who are selling furnaces for the money they get. (b) This would be a wonderful thing, if it ever happens. Every installer should be licensed."

"(a) By all means, any sucker can now install furnaces. (b) Most emphatically."

"(a) Yes, if politics are taken out of its control and men who are *real* engineers are in charge. (b) Not necessarily. The man laying out the system should be an engineer. An unskilled installer may do a poor job but if laid out right it will work right."

"(a) We question any particular advantage being derived from state laws. (b) No."

"(a) I think it would be a good thing if handled on the square. (b) I do think something should be done to protect the public as well as the man that has given his work some thought."

"(a) Yes, would tend to bring about better installations and bring the reliable, legitimate dealer into his own."

"(a) Yes, if the laws are written by men who know how the work should be done. (b) Yes."

"(a) Yes, it would add greatly to the service a heating plant will give by proper installation. (b) Yes, it would cut out every inexperienced man from going out and putting in a plant any old way and causing so much complaint about furnaces being no good."

"(a) Yes. (b) Yes, providing such laws prohibited owners from buying from mail order houses and let any but licensed installers put same in."

"(a) We are of the opinion that state regulation might be made to act to the advantage of the public and the conscientious dealer or jobber. On the other hand, it might act against the conscientious and established dealer or jobber. Would be a good thing if it could be based on fairness to both parties, as this is the only lasting method. (b) We think that the dealer who sells should carry as much responsibility as the installer and that the whole question hinges on the requirements of the license. It is true that the dealer who carries furnaces as a side line does not know his furnace overhead and dealer's liability in

the matter of conscientious service and expert advice to the customer."

"(a) We think so. (b) Positively we do. What would the medical profession amount to if no one needed a license? And we certainly do affect the health of a family one way or another when we heat the home they live in."

The balance of the replies are of the same tenor, the only apprehension being that the laws should be drawn by experienced heating men and not politicians.

Gravity Ventilating Systems Found Wanting On Larger Buildings As Science Progresses.

D. M. Haines Shows How Mechanical Means Only Can Provide Fresh Air on Bigger Structures.

GRAVITY ventilating systems are cheaper and are therefore in wide use, but their functions are limited and circumscribed. Real ventilation for large edifices and buildings given to public gatherings can be obtained only by scientific and mechanical means through electrically driven motors, fan apparatus, air washing apparatus, temperature control and air humidifying apparatus.

These are the conclusions of D. M. Haines, president The Haines Company of Chicago, blast heating and ventilating contractors, and third vice-president of the National Association, Sheet Metal Contractors of the United States, in a special article on ventilation prepared for AMERICAN ARTISAN AND HARDWARE RECORD. Mr. Haines' article is as follows:

Mechanical Ventilation as Compared With Gravity Ventilation.

The writer in a lecture given before the National Association of Sheet Metal Contractors on the subject, *Ventilation, Its Place and Necessity in Modern Buildings,* referred mainly to mechanical ventilation. For some time, advocates of gravity ventilating systems have have been active to convince the public that mechanical apparatus for ventilation is not necessary.

The object of this article is to bring out the favorable points of mechanical ventilation as compared with gravity ventilation in buildings constructed for gatherings of persons for worship, educational and similar types. This, of course, eliminates any discussion of small buildings, residences, etc.

By mechanical ventilation we mean the induction of fresh air heated to a comfortable degree into buildings of the above type and eduction of foul air. All accepted ventilating laws are based on the fact that a specified amount of fresh air must be provided in a given time for each occupant in a room at a comfortable temperature. This temperature is taken in this country at about 70 degrees F. This of course has led also to the adoption of the use of mechanical apparatus for the removing of foul air from buildings. These fundamental requirements or ventilating laws establish the necessity of using positive methods of introducing the required amount of air into the buildings and rooms thereof.

It is also essential that these quantities of fresh air are supplied to the various rooms in the building in a way that the quantity and quality of this air can be measured by acceptable instruments.

Gravity systems designed to comply with ventilating laws as accepted by the larger cities of our country must have large enough duct sizes to allow for the slow velocities given to the air by heat induction only and none at the best in any way assure a positive movement of air, either fresh, temperate or foul. It is for this reason that gravity ventilation systems have never received a full approval from ventilating authorities in larger cities.

If gravity ventilating systems are properly designed as to capacities of ducts and register openings their cost would about equal the cost of installation of mechanical systems, including apparatus. One of the main reasons for installing gravity systems in ventilation is that the public has been misled as to the cost of same and have been made to believe that they are much cheaper. The operating of a mechanical ventilating system is an item that the owner objects to, and wants to save, but experiences of owners of successful theaters have found out that the operating cost of a proper

David M. Haines

mechanical system is a well paying investment.

Humidity has become one of the great factors of proper ventilation. On account of the unreliability of the measurement of air in gravity systems, the exact percentage of moisture to be given the air in this type of system is very hard to control and if it is to be accomplished by installing humidifiers in each and every room, the cost of this ventilation and maintenance becomes prohibitive.

Gravity ventilating systems are usually designed to allow cold fresh air into the building to a point where direct heating surfaces are installed, and if these surfaces are spread throughout the building and sometimes one and more units in each and every room of the building, the heating surface has to be greatly increased to allow for this infiltration of cold air and therefore necessitates the increase of radiating surfaces, pipe sizes, valves and fittings throughout the building.

Some authorities on gravity ventilating systems advise the opening of windows for the purpose of allowing cold air to enter into rooms through these windows and mix with the air in the rooms without being subjected to any heating surface. It becomes necessary therefore to control the temperature of the air in these rooms by manipulating the windows and this usually becomes everybody's or nobody's business and leads to dissatisfaction and a general condemnation of such a system. The elements of weather also greatly combat any gravity ventilating system requiring open windows, as a strong wind aided by rain or snow on all rooms on the windward side would necessitate the closing of windows and thus at once stop the scheme of this type of ventilation.

City authorities and ventilating specialists who have tried to ascertain the condition of the air and the quantities of air supplied or discharged in systems of the above type have been unable to ascertain the correct data of air changes taking place in the various rooms of a large structure with any degree of accuracy.

Rooms situated at different elevations and especially under the roof must receive different treatments as it is quite possible in buildings of some height that the lower rooms will ventilate into the upper rooms and the use of any type of back draft dampers in these types of system have nearly always proven a failure. Under adverse conditions back drafts are established. The adjustment of doors and the opening and closing of same also enter into the phase of discussion of these systems.

It must be evident already that a positive or automatic control of the temperature, changes of air and humidity becomes a very delicate problem in gravity systems. The condition of the air is then entirely controlled by human opinion and especially in large rooms, such as lecture halls and auditoriums which accommodate a large number of people in a close seating capacity, it becomes a serious factor.

It is of course maintained by advocates of gravity systems that the maintenance of a comfortable temperature of a room is not as important as is usually assumed and that better health is obtained by creating outdoor conditions in rooms occupied by human beings. This fact in a general way cannot be denied because if it was possible for all of us to live in balmy climates and conduct our business under shade trees and on green lawns, we would all prefer it. This, however, is only a dream with most of us who have to earn our living in a large city and in congested districts.

Under these living conditions it becomes necessary that the air be washed to clean it of all dirt and foreign matter accumulated. How this can be effectively done in a gravity ventilating system is a question I am unable to answer. This point of the use of air washers leads the writer to register a surprise of the fact that they are not used in the schools in the city of Chicago, whereas in other cities they have been considered an absolute necessity to give good ventilation, even in cities where fresh air is far more easily obtained than in a city of Chicago's size.

It is nearly impossible to dehumidify air in case the outdoor air becomes saturated during rainy weather, when gravity ventilating systems are used.

The failure of operation of some furnace installations without the use of fans have proven that circulating air in a building by difference of temperature only is not positive enough to assure the best results. In fact, on the leeward side of a building on a windy day the air may be sucked out of rooms instead of fresh air entering into rooms, which would upset the gravity method of circulation.

Any ventilating system that depends on the opening of windows cannot be adopted in buildings that contain auditoriums, libraries, lecture rooms and music rooms, as all are subjected to outside noises which are undesirable in this type of building.

Gravity ventilating systems are perhaps the first type that were used to give a supply of fresh air to people inhabiting buildings where ventilation was desired. Science has greatly improved upon this system in these days where it becomes necessary to gather a number of people in congested areas by providing improved mechanical means in the form of electrically driven motors, fan apparatus, air washing apparatus, temperature control and humidifying apparatus for the positive means of supplying air changes.

Hamilton & Hamilton Still in Business.

A letter from J. T. Hamilton, of Hamilton & Hamilton, hardware merchants in Oskaloosa, Iowa, states that they are still in business, although we had been informed by parties, whose reliability we have had no reason to doubt, that the business had been sold out to R. E. Redman.

The "alibi" is failure's apology for lack of performance better efforts would have achieved.

Has Pipeless Furnace Sale Decreased—Why? Asks Champion of This Form of Installation.

George Washington Turton Gives History of Pipeless Furnace Demand During Boom Times of 1920 and 1921.

Written especially for AMERICAN ARTISAN AND HARDWARE RECORD by George Washington Turton, Niles, Michigan.

I DO NOT expect all readers to agree with all statements in this article. In fact I hope you don't. I much prefer to have you pen your protests with reasons showing I am in error.

If you come back with snappy defiance I shall feel my effort has been rewarded by stimulating you to thought, discussion and action, all for the betterment of the profession.

We gain knowledge by free and fearless exchange of opinions, fully as much from disagreements as from agrement. Especially so if statements are based on good reasoning and experience. Such is the mission of this article.

Information from various sources seems to confirm the statements that the ratio of pipeless to pipe furnace sales for 1921 and 1922 is less than the ratio for the two preceding years, which were the banner pipeless years. This information comes from factories, salesmen and installers. And from some of the same comes the tantalizing, "I told you so, kid! A new broom sweeps clean! Only a fad! Just a passing fancy—all passed but the sorrow and regret!" All of which excites us to the stinging, satirical retort: "Well, well! So bad as all that?"

One of the many errors humanity is prone to make is to jump at conclusions without a foundation or pillar to support the expressed opinion or thought. This is no attempt to defend or excuse the pipeless for fiddling in the race. But a square deal is to give the devil his dues no matter where, who or what the devil it is.

The pipeless needs no defense. Merely an equal chance by installers as qualified for pipeless installation as they are for pipe installations.

At this point permit me to repeat: *It requires a more thorough knowledge of the definitely fixed principles of heating to properly install a pipeless than is required for a pipe installation in the same house, both types being adaptable.*

Treat the pipeless scientifically and it will beat its older brother "to a frazzle." Sufficient proof of this has been furnished by the authoritive tests at Urbana, Illinois, which

George Washington Turton

authority rates the pipeless fifteen percent more efficient than the pipe heater.

Al of which makes you more eager to put the question: Why then have pipeless sales fallen off, comparatively?

Not for one reason alone but a combination of several. You all agree that extensive and persistent advertising sells goods. There never was a time when a more extensive pipeless campaign was executed than during 1919 and 1920. The present generation never before witnessed such a shortage of goods and such a demand for them.

Are you all aware of this fact?: *The big majority of pipeless sales during those two years was made by installment furniture dealers.* Furniture factory outputs were sold nine months beyond capacity and dealers could not get goods to sell. Live pipeless manufacturers saw an opportunity. Salesmen were coached to "go after the furniture dealer. He has nothing to sell. Show him how a pipeless department will fill the vacant spot in his business."

And they did. And in justice to these salesmen let it be said that they did not knowingly use any improper business methods. But through both ignorance and innocence of all concerned, the furniture dealer was persuaded to believe that his lack of knowledge and experience in the furnace and heating game would not prevent his doing a volume business. "Anyone handy with a screwdriver can install a pipeless. Just follow instructions from our engineering department and you can have no trouble."

Then he was shown a fine cut of an installation being made by a fellow with slick hair in the college-brush-back style, spotless white shirt and cuffs, and hands unsoiled. The anxious dealer took wings and soared into the realms of expectancy and easy money.

And they were not disappointed. Many furniture dealers installed over 100 pipeless each during the last six months of 1919. And in spite of novice installations, results were entirely satisfactory to purchasers. Surely this is ample proof that the pipeless in skillful hands is little short of marvelous.

The wonderful results caused these same dealers to redouble their efforts in 1920 and their sales increased to 300 to 500 each; and this was the beginning of trouble. User demand increased. Factory supply decreased. Dealers became more anxious for quicker and more installations. Up to this time they had followed factory instructions. Now they were chaffing because it

required four days to send floor plans from the Eastern coast to the factory in the Chicago district, and get blueprint instructions in return. The governor belt was off and the speed wagon running wild.

Floor plans reached the factory during the morning of the second day and blueprint was in the return mail before six p. m. But that was too sluggish. There must be more pep. At the time I was on the receiving end of many such demands.

Spurred on by the satisfactory results from their 1919 installations these dealers, rubbing shoulders with some of the factory salesmen, conceived the cock-a-hoop idea that they could dispense with much of the factory assistance. So they began making installation according to their own ideas, sending only the seemingly difficult plans for factory instructions.

Results from these supposedly easy installations during the winter of 1920 and '21 counterbalanced the good reputation started the previous winter. And many of these factory made heating engineers discovered that instead of boosting testimonials they had a bunch of complaints and demands to make good or "take the durn thing out," both of which gave the profit roll a gaunt feeling.

And the natural consequence: buyers became skeptical and hesitated; the made-over furniture dealer lost his spizz—slowed down to a shuffle instead of his former snappy stride.

About this time the furniture factories had accumulated a little stock and Mr. Dealer was "delighted" with the excuse to shed the pipeless and get back into a game of which he had greater knowledge.

In 1919 pipeless sales to pipe sales were as two to one. In 1920 the ratio was four to one, which evidences what can be done with a good thing when properly handled. Subsequent results indicate what happens to a good thing when oversold and shamefully abused by incompetent handlers.

Don't form hasty and adverse pipeless opinions. What are you doing to learn the mysteries of the pipeless, anything? If not, you are quite apt to have to submit to keeping quiet, without a comeback, when you provoke some fellow into telling you that you don't know what you are talking about.

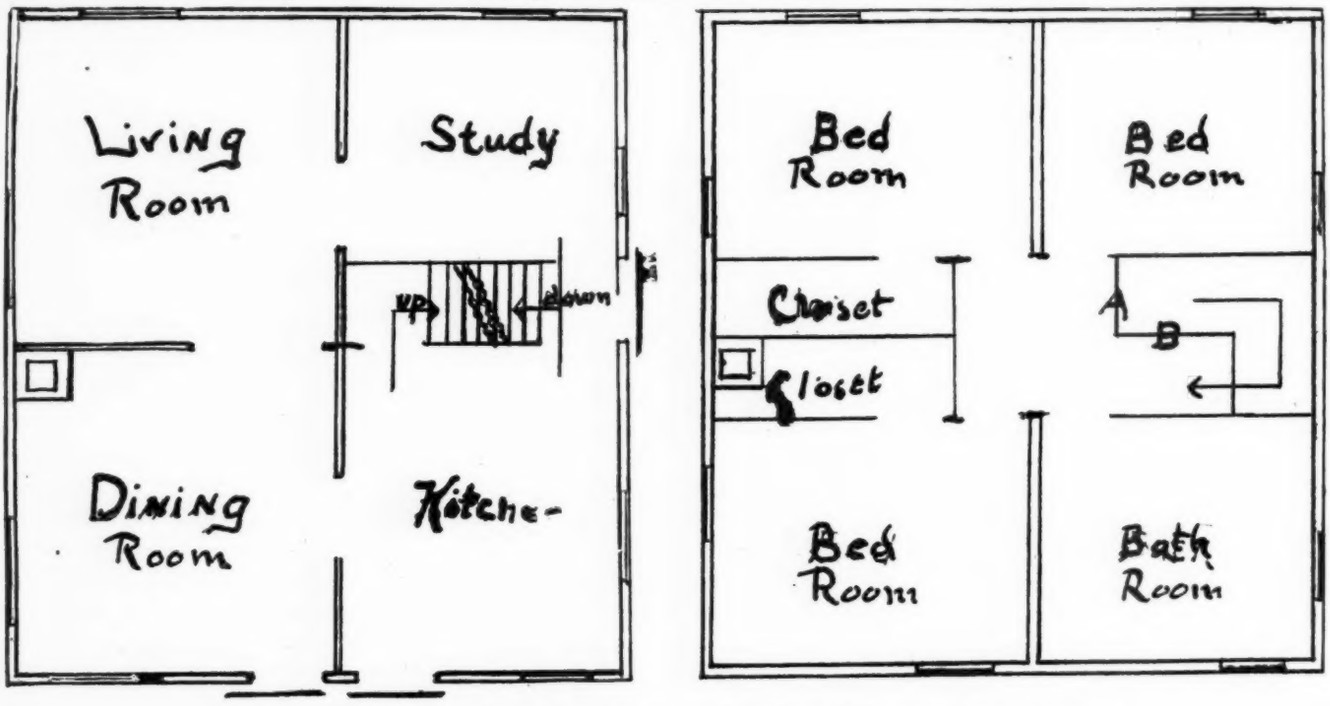
The pipeless is not on the road to discard. Many careers have been greatly stabilized by a temporary check. A recent article from the pen of a pipe advocate suggests much larger leaders and no stacks to second floor. He says that sufficient volume for entire house delivered to first floor will be distributed via the stairway to second floor. Valuable discovery! If this gentleman will experiment a little further by amputating the leaders as well, he will have another admission to make.

All home owners cannot be satisfied with the same kind of a heating system. And each is entitled to his preference. There is room for both systems.

The health and comfort of families and loved ones is at the mercy of the heating engineer or installer. Is your advice drawn from the tank of facts or from the fountain of bluff and bull?

Suppose a customer should give you his house floor plans like the following, with full basement, and advise you that he wanted a pipeless. What would you advise him? If you accepted, how would you make installation? A free and fearless discussion may enlighten all of us willing to learn.

(First floor—Ceiling 8′ 6″; doors and cased opening 6′ 8″; closed stairway. Second floor—Ceiling 7′ 6″; doors 6′ 8″; temperature desired, 65°, temperature for bath 85°; spindle railing at A and B.)



Problem in Pipeless Installation Put by George Washington Turton, Niles, Michigan.

Pipeless Favored by Few Installers and Only When House Is Compact and Unified.

Some Furnace Men Believe Pipeless Installation Is Never Adaptable, While Others Report Good Results.

THE pipeless furnace is not in high favor with the furnace installers of the country.

The questionnaire addressed by AMERICAN ARTISAN AND HARDWARE RECORD asking them, *"To what kind of buildings is the pipeless warm air suited?"* produced a number of replies to the general effect that no such type of building existed. Other installers, who gave the query a more serious consideration, were more or less of the same opinion that only structures small, compact and with large and open orifices between the rooms and chambers, were adaptable to this form of furnace?

Below we have listed some of the replies, particularly from installers who have given the pipeless furnace an opportunity under favored surroundings:

A. C. Tinker, Manager Liberty Special Company, Conneaut, Ohio: There are so many things to be taken into consideration in locating, selecting size, amount of glass exposure, construction of building, location of stairway, size and height of openings, location of basement in relation to the rooms above, height of ceilings of different rooms in old houses, that every house has to be studied for results. There have been so many mistakes in the locating and laying out of pipeless heating jobs that the public is becoming dissatisfied with this kind of heating on account of not enough care in the installation and providing the necessary grills and ceiling registers to do away with the congestion sometimes found in this kind of heating.

In judging any of the different methods of heating in the average house, all have their faults. It depends largely on the conditions as you find them with your customer, as you are not trying to sell him a furnace exactly. You are simply assisting him in the purchase, giving him the benefit of your experience.

The pipeless warm air heater is best adapted to buildings with basements situated so as to get heat direct into rooms on north and west. All opening between rooms should be as high and wide as possible. Never heat more than one large or two small rooms through single doorway, unless doorway is extra wide and top within a few inches of ceiling without providing grills in side wall to relieve the congestion."

John F. Werner, Tracy, Minnesota: For a one story building where the doorways are very large; they may also work good in one room store, and then I have always had better luck with the three register system.

A. A. Clendenning, Keota, Iowa: To buildings with large openings between rooms and square or compact in shape. Two story buildings with large open stairs and large openings below are also very satisfactorily heated. Oftentimes the customer is replacing stoves with the pipeless and it does so much more that he is entirely satisfied even though his home is not entirely heated as it could be with pipes.

C. L. Epps, Van Wert, Ohio: Store buildings. For residences that can be heated with one warm air register. I put in two cold air pipes taking the air from the outside walls thereby stopping the cold air traveling over the floors. I have changed several pipeless jobs to three register jobs this summer and I now have on my desk the cost figured on changing another one.

The Lathrop Furnace Company, San Antonio, Texas: Auditoriums, Convention and other halls, and some specially adapted buildings.

Baird-Swannell, Incorporated, Kankakee, Illinois: Square and with large openings between rooms, or putting it in another way, to buildings owned by persons who refuse to listen to reason and install a real heating system which is the pipe job.

S. D. Helm Manufacturing Company, Crawfordville, Indiana: I would say that a pipeless furnace is not suited to the building but to the customer.

E. H. Snow, Sleepy, Eye, Minnesota: Buildings, in the first place, for one family. Buildings with large doors in interiors. Buildings that are not worth a hot water heating plant, etc.

W. E. Foncannon, Ashland, Kansas: All buildings that do not have a very large hall can be heated by a pipeless. They must have a free circulation of air.

A. A. Richards, W. E. Richards and Sons, Roanoke, Indiana: Small type, open room buildings. Never try to sell a customer a pipeless job, which will not deliver the goods in his type of house.

Charles E. Hedblom, Naperville, Illinois: None. We do not talk pipeless furnaces at all, although we have one on our floor to convince customers they are not satisfactory.

Silverton Blow Pipe Company, Silverton, Oregon: Residences with rooms arranged to allow easy circulation. We refuse to sell where a building is not suited for pipeless furnace.

The Chandler Hardware Company, Sylvania, Ohio: Bungalows and small dwellings with double doors.

J. C. Bayman, Greenville, Ohio: Square, with free circulation of air in every room throughout the first floor.

W. F. Kasbohm, Van Wert, Ohio: Six or eight room house all on one floor with arches from room to room.

Adkins Roofing Company, Wheeling, West Virginia: A small bungalow of two rooms.

J. W. Creech, Williamsburg, Iowa: Have installed pipeless furnaces in quite a few different kinds of buildings with good success.

C. R. Oberholtzer, Angola, Indiana: Small per cent of buildings, except those of open archways can use pipeless heaters successfully.

Good Work and Follow-Up Service Pay in Increased Sales and Customer Satisfaction, Say Installers.

Dealers Almost Unanimous in Giving Further Attention to Educating Householder as to Operating New Plant.

FURNACE installers have an acute sense of their obligations to the customer, and they believe in a service which is what the word means in its fullest and accepted sense.

This was the almost unanimous declaration of installers in response to AMERICAN ARTISAN AND HARDWARE RECORD'S inquiry to the trade on the following related questions:

Do you follow up your sales of warm air heaters when the cold weather sets in by a visit to the customer and an assurance to him of continuous service?

What is your opinion of service as part of a sale?

The comments and observations these questions produced are related herewith because of the value and timeliness of the many suggestions. Attention is called also to the fact that they show on the part of the installers a vigorous effort to elevate the industry to the high plane it deserves.

"Yes," replies the Chandler Hardware Company of Sylvania, Ohio, by R. A. Chandler, "if every job does not give satisfactory service in every way we tell our customer we want to know it, and ofttimes send out our service man to make any minor adjustments necessary. We give a written contract guaranteed to heat in zero weather and we always carry out the guarantee, although in only two instances have we had to make any changes.

Service Sells 55 Jobs.

"Our reputation for service is one of the most important factors in our success in the furnace business. Already this year we have sold over fifty-five jobs and the opinion of other owners was an important factor in closing a good many of them.

"Recently we sent out an ad like the enclosed sample which goes to all the owners which we have sold. Within the past couple of years we have also sent out a letter to the prospects suggesting that they get in touch with some of these owners as there should be some in their neighborhood."

A similar viewpoint is held by A. A. Clendenning of Keota, Iowa, who writes:

"Yes, it is time well spent as you can often give them pointers in firing or control of drafts which will save fuel or give the furnace a better chance. Some are using a furnace for the first time while others may have a furnace of entirely new design and I have found a visit often saves complaints which are no fault of the furnace. Then, too, this customer may be in the market some day for another furnace and he will remember your service. I have always used service as a part of a sale and mention it as one of my sales arguments."

The Silverton Blow Pipe Company of Silverton, Oregon, are manufacturers, and their angle is stated by L. E. Eastman of the firm as follows:

"We manufacture our own furnace but advise our dealers to carry out this policy and we do the same in the local territory which we handle ourselves. Service as a part of the sale is very important as misunderstandings are much more easily corrected."

"I make a visit very often in the winter to all my warm air system users," writes John F. Werner, installer, of Tracy, Minnesota, "to see whether or not they are operating their particular systems so it is a coal saver and not a coal eater, like a good many systems are, because the dealer never shows his customer how to operate the furnace with less coal. Service helps me make a good many sales by telling my customers of the service I give them long after the service is installed."

A Nebraska installer had this to say:

"Service, in my opinion, is, or should be, the foundation on which every form of business should be built; not service *promised*, but service *fully rendered*. The furnace business is no exception to this rule. I would recommend less guarantee, more real service, together with plain business horse sense. In making a sale 100 per cent service should be promised and adhered to.

A customer should be made to feel he is dealing with an honest man, so he would not need a beautifully worded and colored manuscript, called a *guarantee*, which one would have to go to court to enforce."

J. R. Everrood of Columbus, Indiana, follows up his installations as follows:

"In most all cases I go to my customers when they begin using the furnace and show them to the best of my ability how to operate the plant to get the best results and assure them that any time that anything isn't giving satisfaction to notify me and I will come as soon thereafter as possible and correct the trouble. Service, as a part of the sale, is the best of advertising."

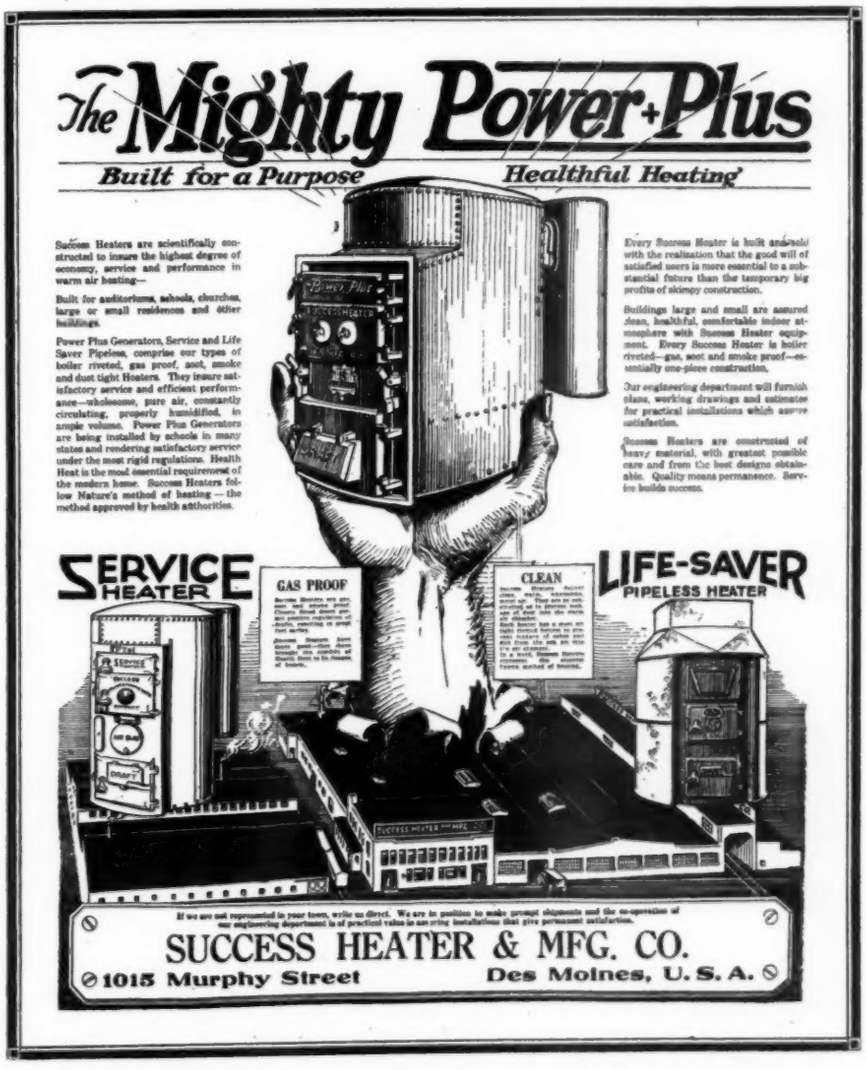
The Liberty Specialty Company of Conneaut, Ohio, through Manager A. C. Tinker, says:

Sell Heat Service.

"We are at all times trying to impress the customer that heat service and length of life of the investment is the issue. Anyone can sell furnaces and get a large repair business. We impress it upon the customer's mind that heat service is all that we sell; that if he buys a railroad ticket to a distant point the railroad agrees to carry him a certain distance for so much money."

"I make it a rule to start a fire first in a new furnace," is the way J. R. Johnston of Henderson, Kentucky, describes the service he gives, "and to give instruction to the owners, and ask them to call on me if at any time they need advice on anything in regard to the furnace. Good service is the best salesman of all."

"We follow up sales even to the furnace we take down and supply with new parts, as it gives us a chance to see how our customers run their furnaces and if any fault is found we explain to them how to run same. This also is a means of keeping our shop in their minds for other work. We believe the dealer should render every assistance to



Broadside Published by Success Heater & Manufacturing Company, Des Moines, Iowa.

The Merrill Sheet Metal Works of Merrill, Wisconsin, writes that "we visit the job during the cold weather and we also encourage our customers to call us whenever they have any difficulty in handling the plant. Our opinion of service, as part of a sale, is to satisfy the reasonable demands of the customers."

Analysis of service was made by Charles E. Hedblom, installer of Napierville, Illinois, in the following words:

the purchaser possible. For instance, we keep all our furnaces cleaned for a period of five years, besides one visit a week to instruct the householder as to the best way to fire and run their furnace."

N. D. E. Richards & Sons of Roanoke, Indiana, believe in sales follow-up as follows:

"We give prompt service on all complaints and repair jobs. Nothing like keeping the customer satisfied; he will boost for you. A sale is never made until all the service needed is given and the customer perfectly satisfied."

"We always follow up a prospect until sold," writes W. A. Covell & Son of Waterloo, Iowa, "and every year thereafter we mail out cards and ask if we should look over their heater; in this way we get a lot of repair and smoke pipe work. After the job is sold and *paid for,* there is no service called for, as it is not at all necessary."

"My aim is to see that the furnace does the work it was intended for it to do," declares W. E. Foncannon of Ashland, Kansas. "A furnace man should look after his jobs as long as the furnace will do its duty and when it is worn out he can sell another, as he has his customer's confidence."

Not all installers believe that their obligations to the customers are as deep as the foregoing, some contending that such extra service is not necessary and others that it is not worth while. Of this group of correspondents we quote from several as follows:

Some Views on Other Hand.

"I try to install the heater in such a manner that there will be no reason why I should need to go near the job unless they want the smoke pipe cleaned. Service as a part of the sale is not necessary."

"No. Service don't amount to much."

"We try to."

"No. Service is 50 per cent."

"No, if a customer has any kick coming he wastes no time following me up. If the job is satisfactory he will do the advertising for me."

"Yes, when I have the time to do it. I think a person should look after a furnace after it is sold to see that it is operated properly so as to give the best satisfaction possible.

"All real dealers do this. Service should be two-thirds of the sale."

"No, we have tried this and do not find where it pays. Service? Why this means to be on the job, to have the goods on the job when wanted, and to take care of any trouble that might exist after installation.

"I don't make it a practice to follow up all sales but do where the customer isn't familiar with the furnace."

"Yes, this should be done by all means, as there are times when it will pay to keep your customer satisfied by a little advice or service that otherwise might lose him. Service is the open door to most of your future sales."

"No, I always find that they let you know, but I try to be prompt to look after their trouble. Service and good work make sales better the following year."

"No. Service should be to make the first fire and show the customer how to keep his fire burning all night."

"No. Service is giving your customer all assistance he requests after the furnace is installed, correcting any faults which may exist."

"Do not, but think it a good suggestion. Service should be a great part."

"Yes. Service is a part of what we sell when we contract and we aim to deliver what we sell."

"Yes. Service is giving our customer the best for the amount paid or getting a price that will satisfy both parties and attending to the customer's calls."

"No, but one should. More service, more sales."

"Yes, a person should get a price which will allow him to give service on the job."

"Yes, I do. Service is the best and cheapest advertising one can have. Service has made Ford's business."

"Yes. We try to overcome service by good installation of good goods. But if it is our fault we are only too glad to give service."

"No. We believe in and do give real service, but probably have been neglectful in regard to furnaces."

"Yes. I especially assure the customer of this fact, so he may get the full benefit of the furnace, instructing him on all points necessary in operating the furnace. I believe it is the duty of a dealer to educate the prospective customer on all points of good heating and follow it out, and thus watch his own interests."

"The better service you render, the more sales you make."

Pages from Selling Helps Booklet of the Meyer Furnace Company, Peoria, Illinois.

Aluminum Paint Is Poorest Kind of Coating for Radiators.

Some time ago the Bureau of Standards was requested by a branch of the Air Service to devise a means for keeping the interior of balloon hangars at as low a temperature as possible. This was done successfully and the results are equally applicable to tents.

If the outside of the tent is covered with a highly reflecting substance, such as white paint, while the inside is covered with aluminum paint, the radiation into the interior of the tent may be reduced by at least 78% to 81%. The reason why this method of painting has this desirable effect is that the white paint reflects the sun's rays while the aluminum paint is a poor radiator of the long wave-length heat rays. Of course, it must be remembered that this scheme for painting tents would have just the reverse effect at night and would prevent the heat on the inside of the tent from escaping into the cooler air outside.

This same work proves that aluminum paint is the poorest possible kind of a coating for heat radiators.

Neither Manufacturer Nor Dealer Is Getting Full Benefit From Furnace Maker's Advertising Helps.

Survey Shows Lost Motion With Retailer Often Either Not Understanding Purpose or Opposed to Literature Sent Him.

WHAT is the best form of advertising helps for the dealer? Probably no query addressed by AMERICAN ARTISAN AND HARDWARE RECORD to the furnace manufacturers of the country brought such a variety of viewpoints and breadth of suggestions. Hardly two were alike, although there was a general trend to give importance to newspaper advertising as the most effective form of dealer help.

This question was naturally linked with the following one—*How can the dealer make most effective use of your advertising helps such as posters, calendars, leaflets, etc.?*—as indicated by many of the replies. The first question was answered by a Milwaukee manufacturer as follows:

"An aggressive advertising campaign by the manufacturer in publications whose circulation is concentrated in the territory actually served by distributors, supplemented by local publicity by and for the dealer so as to capitalize on the manufacturers's general advertising; descriptive testimonial booklets and leaflets furnished by the manufacturer for distribution by the dealer; attractive store display matter." The same manufacturer had these suggestions relative to using the manufacturer's literature to the best advantage:

"By maintaining a live list of prospective furnace buyers and the distribution of advertising matter to that list in an intelligent and orderly manner. Dealer should bear in mind that the distribution of advertising matter is a sales effort and that to be effective must be distributed with the same care and thought that he would use when presenting a sales argument in person."

From a Seattle, Washington, manufacturers' agent comes an illuminating point of view, and one which should interest manufacturer and dealer alike. In answer to the first interrogatory this agent writes:

"We have tried everything and are starting over again," declares a widely known St. Louis furnace manufacturer, in reply to the best form of advertising helps, and this same manufacturer complains that the dealer could more effectively use the manufacturer's advertising helps "by using them instead of throwing them under a work bench."

"Local newspaper advertising without a shadow of a doubt. We can name two or three national advertisers of warm air furnaces whose furnaces are used out here. By actual experiment we have determined that the users of these furnaces do not know the names of the plants—merely remembering the name of the dealer."

"The best help for a dealer is newspaper ads and personal letters sent out from the manufacturer's home office to the dealer's prospects."

This same idea is carried into the answer to the second question, in

Newspaper Page Advertisement, Run by R. J. Schwab & Sons Company for their Milwaukee Dealers.

which the suggestion is made that the manufacturer can be of most aid by devoting attention to "fewer posters, leaflets, etc., and more help to the dealer in local newspaper work."

Here are selected at random a number of replies to the question as to the best form of advertising helps for the dealer:

Some Random Replies.

"Goods well displayed in show windows with sign and ads calling attention to the particular heater."

"Educative information that makes it easier for him to convince the prospective buyer."

"The kind he will use—who knows?"

"Direct appeal."

"Bill boards and circulars."

"Direct by mail to lists of prospects."

"Direct letters to retailer."

"Daily newspapers."

"Newspapers and posters."

"Direct to consumer."

"Advertising in home paper."

"Long story!"

"Direct mail."

"Live newspaper copy."

"Properly prepared circulars."

"Newspaper ads which he pays for."

"A list of his prospects followed up by him, also our traveling representative and through our office prospect follow-up mailing department."

The most effective use of the manufacturer's literature can be obtained, according to these correspondents, as follows:

INCREASED COMFORT WITH LESS FUEL
Installation of the Lennox TORRID ZONE—MONOPIPE Furnace will greatly increase comfort in the home throughout long winter days and yet materially decrease the amount of fuel used, thereby affecting real economy.
The TORRID ZONE—MONOPIPE provides at all times clean, even heat throughout the entire house. All steel construction does away with gas and smoke, which soils furnishings and is so unhealthful to breathe.
WHEN NATURE TURNS OUTLAW
LOCK OUT KING WINTER
OX
FURNACES
MEANS HEATING ECONOMY
CONTINUOUS AND LASTING SERVICE
When it comes to making a furnace that's absolutely proof against the rigors of hard usage—that means heating economy coupled with continuous and lasting service—there's no material under the sun so satisfactory—so thoroughly reliable and competent as steel.
Steel is the material that goes to make the LENNOX TORRID ZONE FURNACE the leader of them all. Here's a sturdy, dependable furnace that wins the hearty approval of every home owner. It cuts a big slice from his fuel bill—heats his home with a pleasing volume of purified warm air throughout the coldest months, year in and year out—indefinitely.

Pages From Selling Help Booklets of Lennox Furnace Company, Marshalltown, Iowa.

"By following up his prospects closely and take advantage of the sales help of the traveling salesman as well as sending in names to the company's home office to be worked on by mail and passing out circulars and catalogs."

"Through a house to house canvass."

"By personal effort to explain the facts."

"By co-operating with us and using it as we intend."

"By posting and distributing judiciously and following up."

"By use as directed."

"By supplying the names and accurate addresses of live prospects regularly."

"Send to retail with personal letter."

"By using them as they are intended."

"By using everyone of these."

"Following up all inquiries."

"By distributing them."

"Another long story."

"Use them—get them out."

"To a select list of prospects."

"By proper distribution."

"Mail direct to prospects."

"By proper distribution at right time."

"We believe in direct, personal selling principally."

New Principle of Health Heating
THE FARRIS WATERBASE FURNACE
Puts Health Giving Humidity Into Heated Air
ASK YOUR DEALER
I. G. LINVILLE, Maroa, Illinois
or write Farris Furnace Company, Springfield, Illinois

Street Car Advertisement of the Farris Furnace Used by I. G. Linville, Maroa, Illinois.

Colored Poster, Furnished by R. J. Schwab & Sons* Company, Milwaukee, Wisconsin.

All in all, these suggestions cannot be considered very flattering to the dealer. But isn't it up to the manufacturer to educate him, using the utmost tact and patience for, after all, he is the one who makes the sales that make it possible for the manufacturer to run his plant?

But without making further comment, let us turn to the dealer's side and see how he answered the question as to what use he was making of the manufacturers' dealers helps. Here are some characteristic replies:

The Dealer's Side.

"Yes."

"Very little."

"All I can get."

"I use all that I can get."

"My company does all my advertising as you probably know."

"Any that I can."

"We think that each manufacturer should help, and we have found this very satisfactory."

"Give them to prospective buyers."

"Give them the names of my prospects and get in touch with the same."

"I use them."

"Use it all."

"We study them carefully and use such as seem to fit our requirements."

"Everyone should use them."

"It isn't worth a dime."

"I send their circulars to all my customers."

"I use some from one house on high grade heating; that is, the C——— Heating Company."

"None."

"I send them to the prospect."

"Circulars, etc."

"None."

"I use their fence signs and descriptive matter."

"By either sending them out ourselves or sending the names of a prospect to the manufacturer."

"Not as much as we should."

"We use the manufacturers' advertising matter to show the customer, where the manufacturer stands, plus our own to show the customer where we stand."

"I use their cuts on all of my stationery."

"Not much."

"Not any."

"None."

"When I ran a shop I always used manufacturers' advertising helps and found them very good."

"We use all they give us, such as envelope stuffers, etc."

"Find leaflets best. We wrap them in packages of goods purchased."

"Use all sent us—newspaper and circulars."

"None."

"Mailing list and window display."

"All that I can get."

"Send out or hand to prospects."

"I do not use much newspaper advertising."

"I distribute circulars sent me by manufacturers."

A Furnace That Outlasts the House--

FOR your new home, or for replacement, here is a furnace we can honestly say is a remarkable one. Built to fit your home and heat it properly with **less fuel.** It cannot be classed with the "cheaper" furnaces as it is in no way made to sell at a "price." But, if you want a furnace whose usefulness outlasts the house itself, SEE the

PREMIER
WARM AIR HEATER
(Made in Dowagiac, Mich.)

and look over these superior features that form a big part of a furnace for length of service, saving of coal and in making your home comfortable.

Deeper and heavier feed section. Extra well fitted fire doors—large capacity humidifier—convenient lever for shaking grates—larger radiator, swinging to any angle—larger casings giving 75% greater air circulation—combustion chamber giving 50% greater capacity—made high, straight and more durable—deep and straight firepot, built to last and to give greater fuel capacity. Improved grate removes ashes without waste of coal.

No Gas - No Dirt

Direct draft damper eliminates smoke trouble when firing. Double flanged, permanently sealed joints make it gas tight—for this feature alone you should decide on the PREMIER. Improved ash pit eliminates dust and aids combustion.

But let us tell you more about it. See for yourself. We guarantee expert installation on every furnace. Let us tell you what it will cost for your home!

(Dealer's Name and Address)

A Retail Ad of Premier Furnace Company, Dowagiac, Michigan.

AMERICAN
BOILER-PLATE
FURNACE

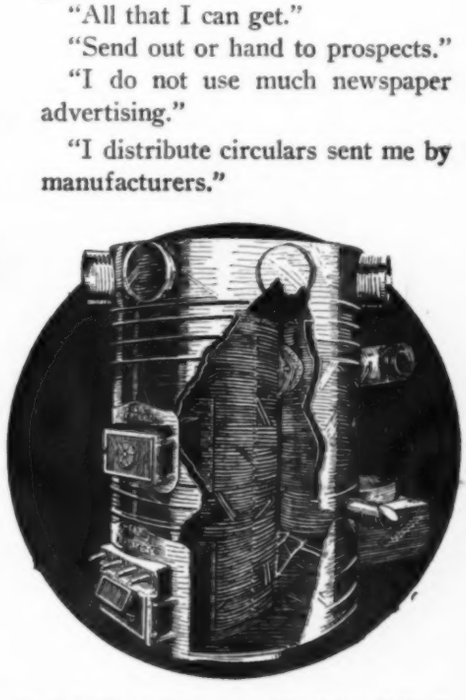
Doesn't Smoke Nor Go Out Nights!

It's a GOOD Furnace!

THE DALZELL BROS. CO.

"The Roofing and Sheet Metal Folks"

21 Holmes St.



Street Car Advertisement of American Boiler Plate Furnaces, Used by Dalzell Brothers Company, Youngstown, Ohio.

How a Modern School Building Is Heated and Ventilated by Fan System.

Barbour Intermediate School, Detroit, Michigan, Has Excellent Heating and Ventilating Plant.

AT THE semi-annual meeting of the American Society of Heating and Ventilating Engineers, H. W. Anderson, Assistant Director of Educational Research of the City of Detroit, Michigan, presented a very instructive paper in which the heating and ventilating plant of one of the city's most modern schools was described as follows:

To lay a street car line is a relatively simple engineering feat. The tracks are built level, straight, parallel, and of sufficient strength to carry well defined maximal loads. The planning and construction of the street car itself is not especially difficult. Most of the procedure has been fairly well standardized. It is easy, for instance, to determine the size of the motor required to haul a car of a certain weight, with a known hauling capacity. Long study of these problems has made them appear easy and simple.

To plan an efficient factory of almost any kind is a more difficult undertaking. A study must first be made of the various operations of the factory. These must be coordinated, synchronized and constructed so as to form an orderly, efficient organization, which performs its duties without loss of time and materials. When the engineer has carefully determined the proper factory organization, the architect is called in to co-operate with him in the planning of the building which will house the factory organization. Obviously in the planning of the factory there are many more variables which must be brought under control by the engineers than in the planning of a street car track.

It has been a surprise to learn from prominent engineers that many a factory has been planned after the erection of its building, thus resulting in waste and inefficiency. The tailor who takes the measurements of the body to be clothed knows better than that. Even the school teacher is waking up to the fact that much is lost by erecting the school building before determining definitely what the school organization will be. Comparisons are odious to most people, but one will be risked. As the determination of the factory organization and program is the most important step toward the completed factory, so the determination of the school program and organization is the most beautiful step toward the completed school. B ythis it is not meant to minimize the work of the architect or that of the heating and ventilating engineer. But it is a fact that the architect would be practically helpless in planning an efficient intermediate or high school building without this aid. He might construct a building on the ready-to-wear order but the chances are, by conservative estimate, at least 100 to 1 that it would not fit. Since the work of the heating and ventilating engineer has little relationship to the educational program, he would undoubtedly do a good job. Table 1 shows the unbalanced use of the rooms provided for various activities in a modern high school.

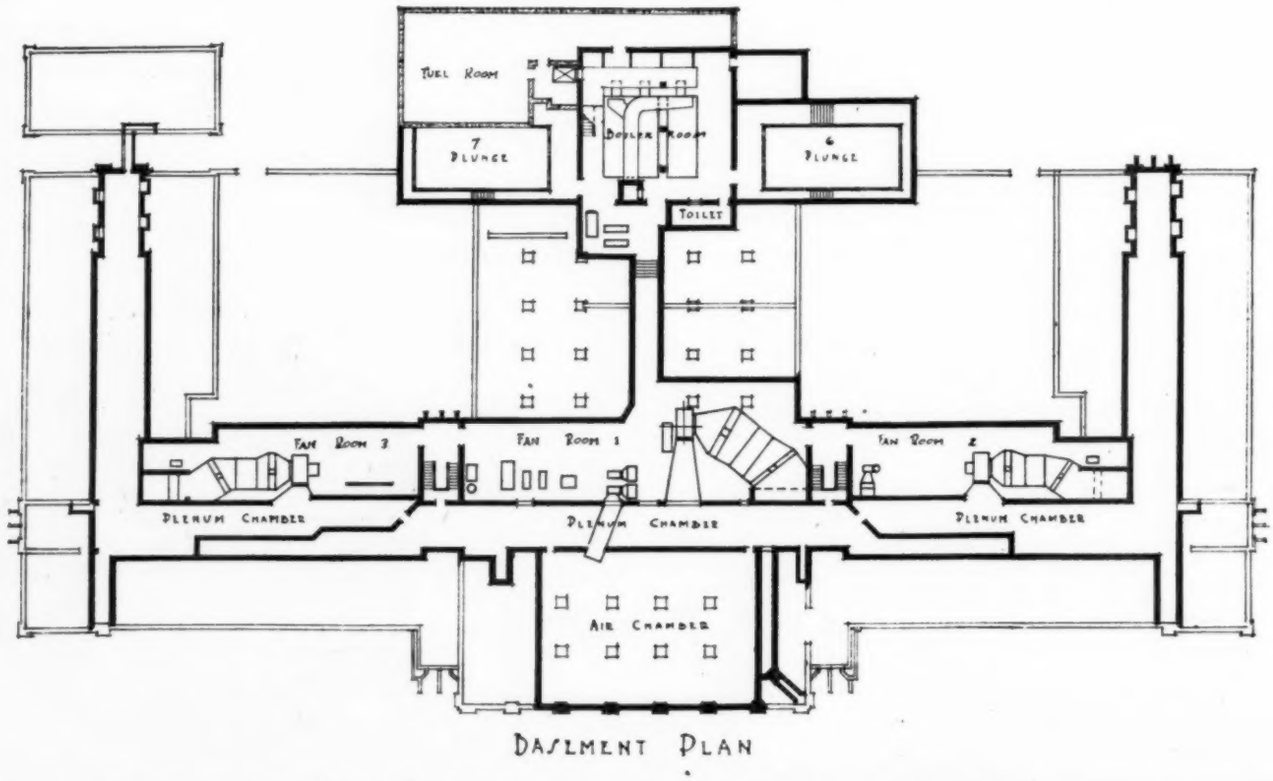


Figure 1. Basement Plan Showing Arrangement of the Heating and Ventilating Equipment.

Table 1. Comparison of Total Capacity and Actual Attendance in various Activities of a Modern High School.

(Ten Period Day)

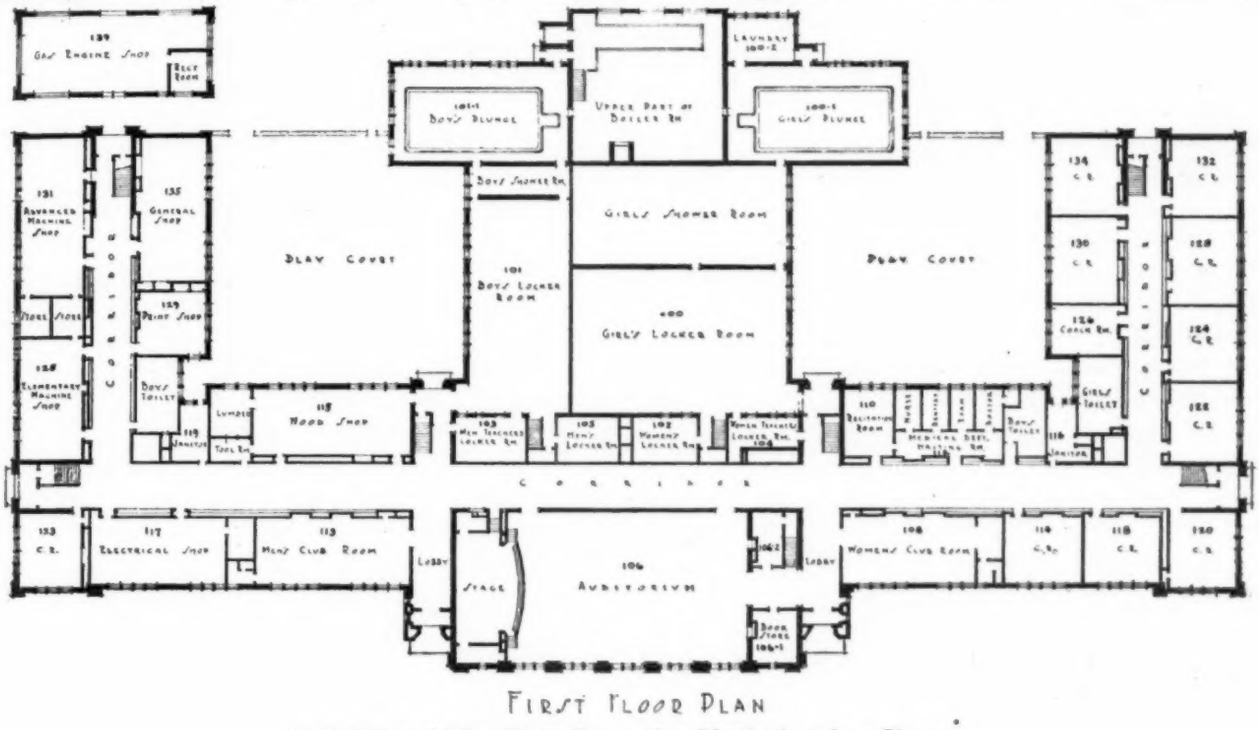
	Cap.	Att'd	Pct.
Music and R. O. T. C.		292	..
Classrooms	7,720	6,524	85
Art	520	393	76
Library	600	457	76
Typewriting	350	254	73
Biology	300	187	62
Physical Education	1,150	631	55
Cooking	240	116	48
Chemistry	740	322	44
Bookkeeping	600	237	40
Shop	540	200	37
Sewing	600	222	37
Mechanical Drawing	620	214	35
Physics	640	136	21
Study Halls	9,470	1,747	18

Architectually the building is a gem; educationally, an atrocity. The table shows that classrooms were used 85 per cent of capacity while study rooms, on the other hand, were used only 18 per cent, In other words some activities were seriously overcrowded while others were only slightly used. When this building was planned the architects performed a splendid service, but the educational authorities fell down on their part when they failed to give the architects a statement of their requirements, based on a scientifically worked out school program.

About three years ago Deputy Superintendent Charles L. Spain and Assistant Superintendent P. C. Packer, under the administration of Supt. Frank Cody, began the movement in Detroit to furnish the architect with educational specifications for schools. In planning the intermediate school, of which the Barbour and Hutchins are the best examples, extensive investigations were carried on to determine the best type of organization, the subjects pupils selected, and the probable program of the new school.

The result was the following general organization. The intermediate school day consists of six 60-minute periods with an hour for lunch. Each period provides both the recitation and the study activities under the teacher who gives instruction in the subject. During the first year the pupils' subjects are much like those of the elementary school so as to insure a gradual transition from the elementary school to the intermediate and high school organizations. When the pupil enters the eighth grade he may choose one of three courses, namely, the general, which leads ultimately to general or professional college work; the technical, which leads to engineering or technical schools; or the commercial course, which may lead directly or through college into business.

The Detroit intermediate schools are socialized schools, they aim to teach the boys and girls to become healthy, useful citizens of any American community. As far as is known the best modern thought has been utilized in providing for the health of the student. The first consideration was the plant itself. The accompanying floor plans, show the layout of the school. As can be seen the building is an open type, E shaped, thus providing excellent natural light in all parts. Classrooms are located on both sides of the corridor. Lighting is unilateral, with the exception of some of the corner rooms which are intended for open air classrooms. The building is grade level, making it impossible to store children in the space rightfully belonging to coal, potatoes, and the winter's preserves. There are no wardrobes, pupils' coats and hats being taken care of in built-in corridor lockers. Toilets are conveniently located on each floor. Proper heating and ventila-



FIRST FLOOR PLAN

Left Wing of First Floor Devoted to Mechanical Arts Shops.

ting mechanisms have been provided to insure healthful air.

The health training facilities consist of two gymnasiums, two covered playcourts, two swimming pools, shower baths and a medical suite. Every one of the 1800 boys and girls take an hour daily exercise and shower bath. The a "health department" is located in the center of the building where it is easily accessible from all parts. This section of the building with the auditorium may be heated and lighted independently of the rest of the building. This provision enables the economic use of these facilities by the people of the community after school hours.

Auditorium in Steady Use.

The auditorium across the corridor from the health department is in use each period. From 70 to 200 or 300 students assemble here each period to listen to lectures on social and civic affairs, and to music; to take part in community singing, dramatization, public speaking and debating. Each student has two hours a week for these activities.

The school program provides for vocational training. Since Detroit is a manufacturing city, the boys select very strongly the mechanical arts courses. For this purpose one floor of one end of the building is devoted almost exclusively to shops. Seven shops have been provided, as shown by Figure 2, and will be used all the time by the boys of the school.

The girls' vocational work is in the home-making courses. Three cooking rooms are located on the third floor adjacent to the lunch rooms. Three sewing and millinery rooms have been located on the second floor near the rooms for art, in which designs for hats, dresses, etc., may be prepared before actually made by the students. Commercial work also constitutes an important phase of the school program. Two special rooms have been provided for bookkeeping and one for typewriting. All pupils are required to take a course of subjects consisting of English, mathematics, science, history and civics, art and music.

Thus, it is seen from this brief summary that an attempt has been made to give in the Barbour Intermediate an opportunity for the best sort of training for the adolescent child who may or may not complete his schooling with the ninth grade.

This entire program was carefully worked out and estimates of the number of pupils who would take each course were prepared before any steps were taken to plan the building. These studies formed the scientific bases for determining the number of classrooms, shops, laboratories, etc. The result of these studies in terms of school rooms has been summarized in Table 2.

Table 2. Number and Type of Schools Rooms—Barbour Intermediate.

	No.	Size	Cap.
Class Rooms	26	22′x26′	35
General Science Laboratories	3	22′x35′	35
Music Rooms	2	22′x26′	35
Bookkeeping	2	22′x35′	35
Typewriting	1	22′x26′	35
Art	2	22′x40′	35
Sewing	3	22′x48′	35
Model Flat	1	....	..
Cooking	3	22′x35′	24
Mechanical Drawing	2	22′x35′	35
Wood Shop	1	22′x52′	24
Print Shop	1	22′x24′	20
Advanced Machine Shop	1	22′x52′	24
Electrical Machine Shop	1	22′x35′	24
Electric Shop	1	22′x43′	35
General Shop	1	22′x46′	35
Auto Shop	1	26′x52′	35
Gymnasiums	2	50′x80′	105
Corrective Gymnasiums	2	16′x45′	35
Swimming Pools	2	25′x40′	35
Play Courts	2	44′x50′	70
Tutoring Rooms	4	17′x22′	24
Home Science	1	22′x26′	24

The special administrative, community and non-instructional rooms of the building have been summarized in Table 3.

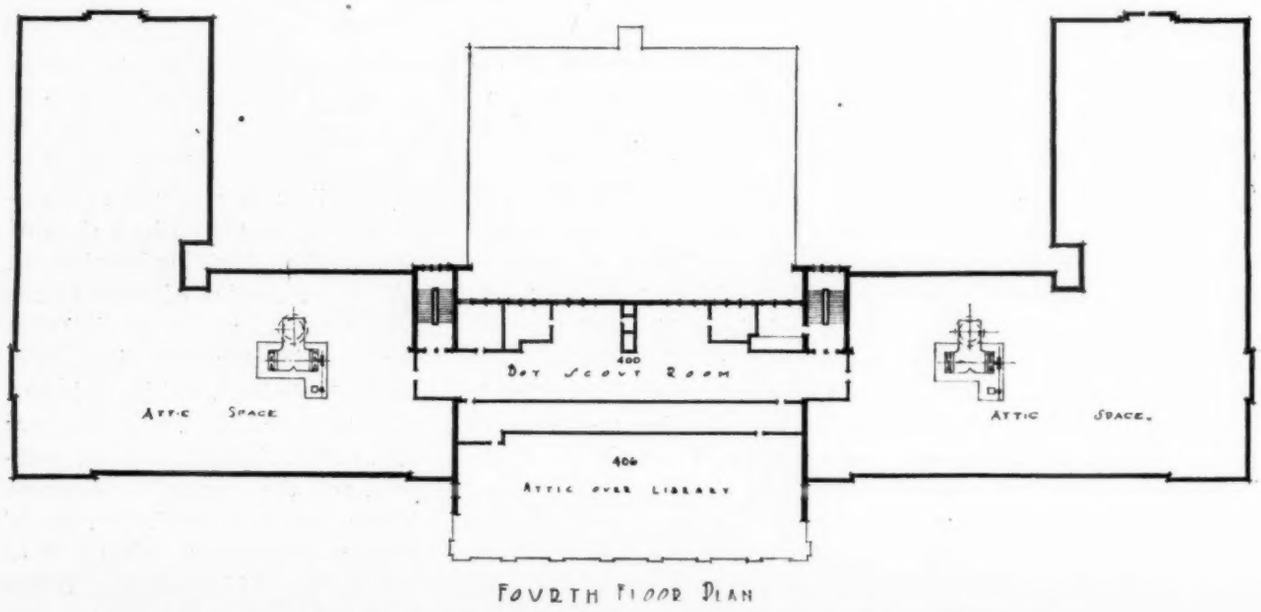


Figure 3. Two Motor-Driven Exhaust Fans Installed in Attic or Fourth Floor.

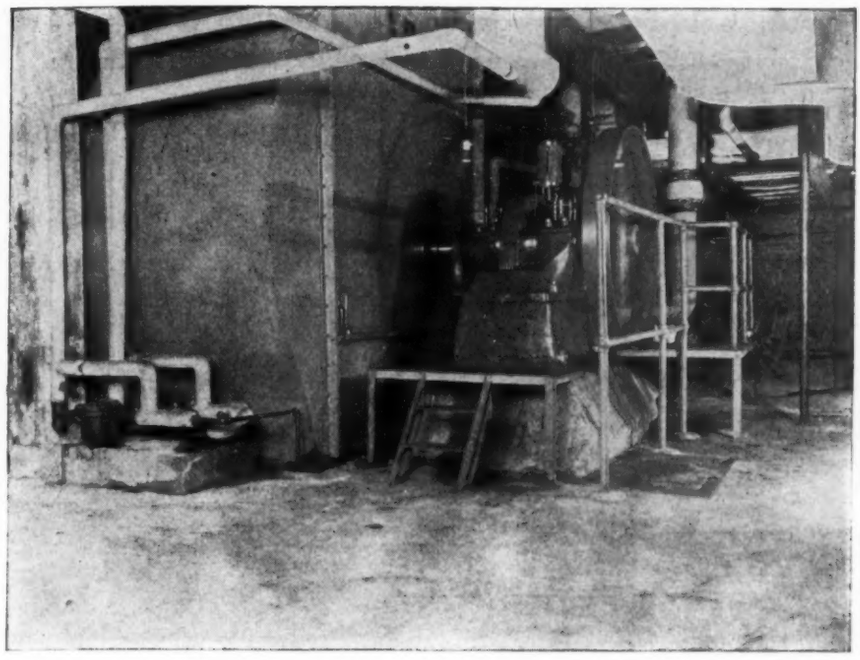


Figure 4.—Supply Fan Apparatus for Auditorium and Gymnasium Section of Building.

Table 3. Summary of the Number of Special Non-Instructional Rooms.

Toilets	18
Offices (administration, etc.)	15
Janitor's Room	5
Cafeteria	1
Boy Scouts	1
Community	2
Locker Rooms (gymnasium)	6
Shower Bath Rooms	2
Medical Clinic	1
Conference and Consultation	4
Auditorium	1
Heating and Power Unit	1

This Society is doubtless particularly interested in the heating and ventilating equipment used in the new intermediate schools, as these represent the latest standards for all new Detroit schools.

For several years, prior to the building of these schools, the consulting engineers for the Detroit Board of Education have been using what might be called a modified split system, wherein sufficient direct radiation was supplied to take care of approximately 75 percent of the heating, and the air used in ventilation warmed sufficiently above room temperatures to supply the necessary additional heating effect. The temperature of the air delivered to each room was under individual thermostatic control, there being separate ducts from the fan to each room. This system, by introducing air into the room considerably above room temperatures, utilized to a large degree the stratification of the air and its settling as it cooled for purposes of distribution.

During the war period the cost of sheet metal duct work mounted so that it became necessary to design a system which would give at least equal results and which could be installed at lower first cost. With this problem to be solved, the consulting engineers, of the Board of Education, gave the matter intensive study and finally decided that a projection system, pure and simple, in which the air would be distributed by virtue of its velocity was the proper solution to work on. They had used ceiling outlets for air delivery many years ago and it was decided to come back to this system in a more refined way, provided the architects could help solve the question of installation of proper ducts in the fireproof buildings. The cooperation of the architects in using the steel pan type of concrete floor construction simplified the problem, making it possible to utilize the void spaces between the concrete floor joists for ducts, these being laid out for the proper location.

The system as worked out has proved very simple and cheap. This was partly made possible by the fact that the Detroit Board of Education started to build schools without basements, Detroit being one of the last of the large cities to adopt this policy. It is therefore possible to utilize a basement corridor under the first floor corridor, as a large distributing plenum chamber for tempered air. This chamber is made of sufficient height for one to walk through an dis equipped with hose conections

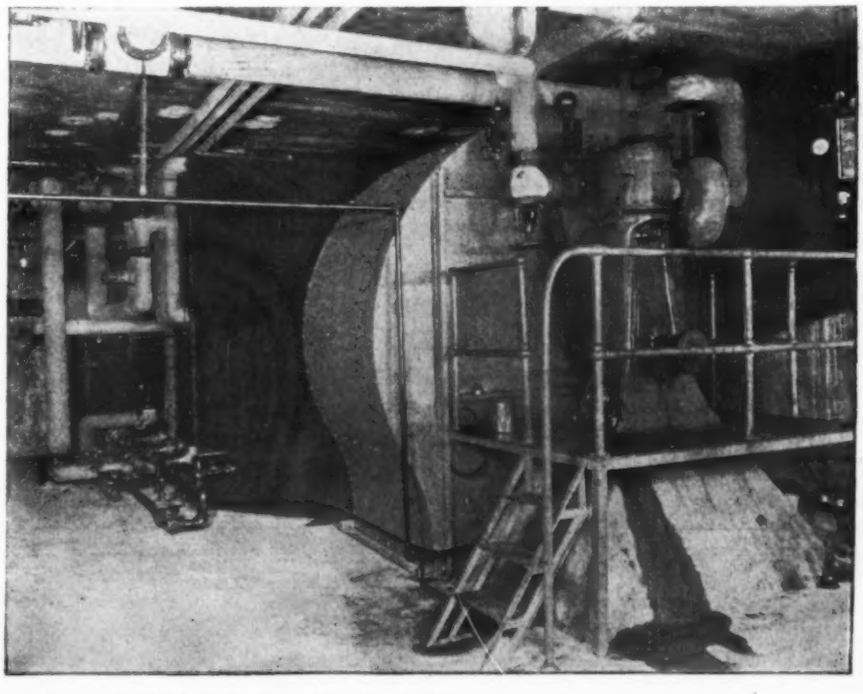


Figure 5. Typical Supply Fan Apparatus for Academic Section of Building.

and floor drains so that it can be easily washed down and kept sanitary. It also serves as a space for carrying steam and return lines, electric conduits, etc. The use of this large distributing plenum chamber has eliminated practically all the sheet metal work formerly used, there remaining simply the verticals to connect with the ceiling ducts.

The results obtained from Detroit's latest system with ceiling distribution of air have proved very satisfactory not only as to first cost, but in the efficiency and uniformity of air distribution. Although the systems are laid out for the old standard of 30 cubic feet of fresh air per minute per pupil, it is expected, due to the uniformity of distribution, to cut this amount down to at least 20 cubic feet of air per minute and possibly to 15. Furthermore, it is possible to recirculate any amount of the air, inasmuch as the fresh air is drawn from above the roof with a connection from the shaft to the attic, which, with pneumatically controlled dampers, makes it possible to use all recirculated air or all fresh air or any desired percentage of each.

The fresh air supply for the building is taken in through three vertical shafts extending from the basement to a point above the main roof. Two supply fans with a capacity of 45,000 cubic feet per minute each (Figure 5), and one with a capacity of 75,000 cubic feet per minute (Figure 4) deliver the air from these shafts to the basement air chamber, extending completely around the building. Each supply fan appartus is equipped with tempering coils, air washer and reheater coils with automatic temperature and humidity controlling devices.

Vertical galvanized iron risers conduct the air from the air tunnel to the various rooms. These risers are installed in the corridor walls and connect to short horizontal ducts in the floor construction or attic above the respective rooms. Two of these horizontal ducts are provided for each standard class room and in each duct are installed three special diffusers or a total of six per classroom, symmetrically arranged in the ceiling. Each classroom is provided with two vent openings for the egress of vitiated air, located at the floor on the corridor side, equipped with grilles or registers, and connections to vertical metal flues leading to the attic. The vertical supply and vent flues in the furred corridor wall are so arranged with respect to the corridor wardrobe lockers, classroom bookcases and closets that the floor space taken up by these flues is reduced to a minimum. The short horizontal ducts in the floor construction leading from the risers to the outlets in the various rooms are incorporated in the concrete construction, the duct occupying the space ordinarily taken up by one row of steel or terra cotta floor tile. In the Barbour School removable steel tile forms were employed in the construction of the concrete floors and in this instance the void spaces formed by the removal of the steel tile were utilized as ducts, a single sheet of galvanized iron and the usual ceiling lath and plaster forming the bottom of these air passages to which the diffusers are attached.

All vent flues from the various rooms open to the attic and as a supplement to the supply fans, two motor-driven exhaust fans of the propeller type are provided in the attic for exhausting the air from the attic through roof ventilators.

The ceiling diffusers are set behind pressed metal grilles flush with the plaster, and are equipped with two sets of diffusing vanes at right angles to each other, as shown in Figure 6. This arrangement of vanes is designed to diffuse the air in the shape of a cone from the outlet to the floor of the room. The outlets in the ceiling are so spaced that these cones of air intermingle and overlap at the level of the breathing zone. Smoke tests made in rooms equipped with this system of ventilation showed conclusively that the air distribution is very uniform. Relatively low velocities at the outlets are employed in order to avoid uncomfortable drafts from the air supplied directly overhead. Figure 7 shows the typical arrangement of ceiling outlets and vent registers in the classrooms.

The auditorium, gymnasiums, swimming pools, locker rooms, shower rooms, club rooms, etc., are located in the center portion of the building. These rooms constitute that portion of the building used for community purposes and are ventilated by means of the larger supply

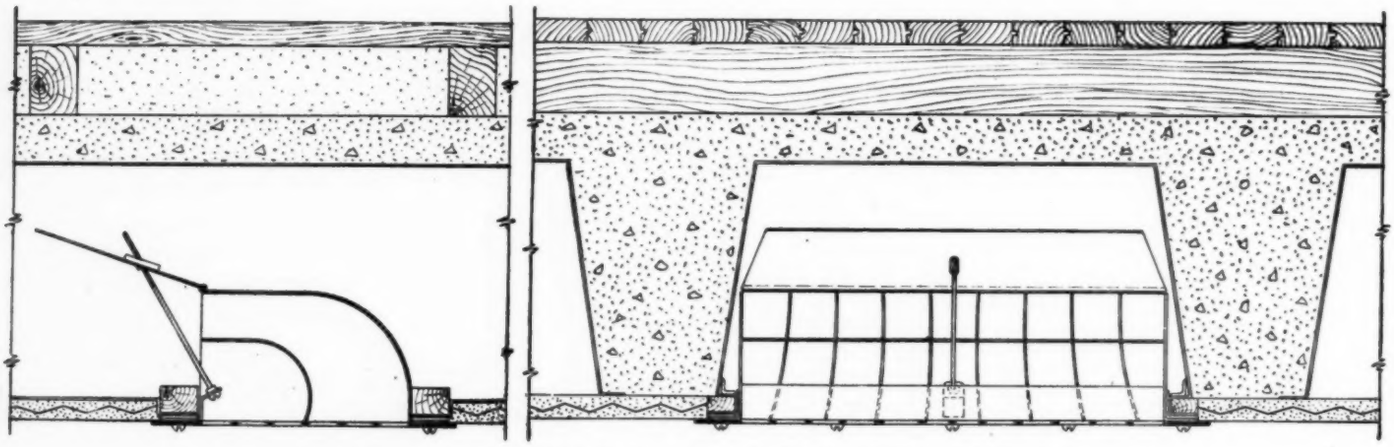


Fig. 6. Detail Showing Construction of Special Ceiling Diffusers.

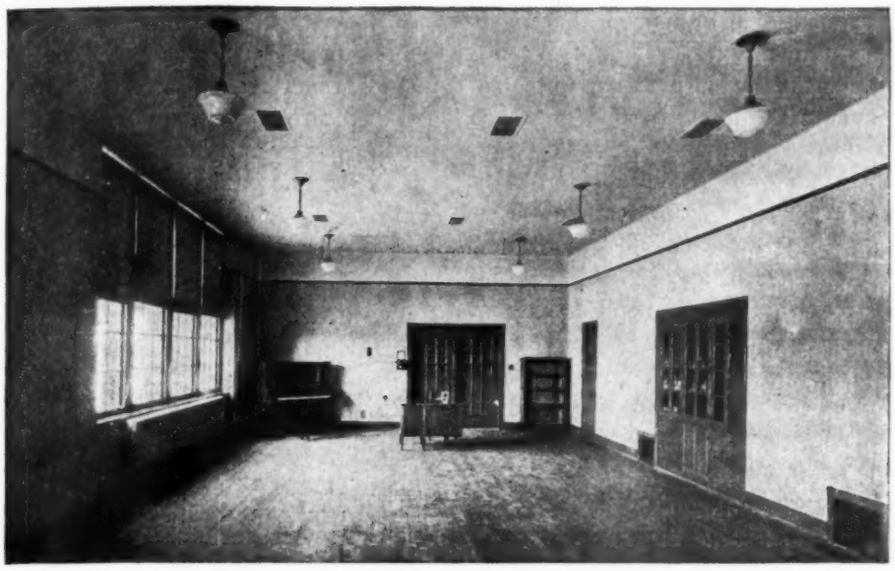


Figure 7. Typical Classroom Interior.

fan and so arranged that both the heating and ventilating systems for this portion can be operated separately from the remainder of the building.

The auditorium is provided with a reversible system of ventilation. During the cold weather the warm, fresh air supply is admitted through four large grilles located in the corners of the room. The vitiated air is drawn off through mushroom ventilators located in the floor under the seats by means of an exhaust fan, which delivers this air through roof ventilators. The space under the auditorium floor is finished off to form an air chamber, which can either be connected to the exhaust fan or to the supply fan by means of suitable transfer dampers. During the warm weather cool air is admitted to this chamber from the supply fan and forced through the mushroom ventilators in the floor, the vented air leaving the auditorium through ornamental plaster grilles in the ceiling connected with vent flues leading to roof ventilators. The entire system of transfer dampers required to reverse this ventilating system is controlled pneumatically by means of diaphragm motors with operating switches located in the fan room. The air supply to the gymnasium is admitted through diffusers and grilles located immediately below the window sills and the vent openings for winter operation are located at the four corners of the room at the floor. During the warm weather, vent openings in the roof connected to the roof ventilators are used.

The fresh air supplied to the locker rooms is admitted through ceiling diffusers and a fan exhaust system is provided, together with a system of underground vitrified clay tile ducts, which exhausts the air from the room through the individual clothing lockers, serving the double purpose of ventilating the room and the lockers. This arrangement has proved very satisfactory as a method for preventing the odors from lockers contaminating the air in the rooms.

A special feature of the girls' locker room is a new type of hair drying equipment. Due to the relatively large number of girl students using the shower rooms daily, it was necessary to provide some means for the rapid drying of the hair. A view of this apparatus, which is installed in the girls' locker room, is shown in Figure 8. This is constructed of sheet metal, suitably reinforced, and is equipped with 24 adjustable funnel shaped outlets, the whole being finished in hard white enamel. The outlets can be readily turned to any desired angle to accommodate students standing or sitting and are so designed that when turned to the extreme lower position, the air supply is automatically cut off from the outlet. The hair dryer is supplied by a small fan located in the fan room below the locker rooms, drawing washed air from the plenum chamber through heater coils under thermostatic control. The motor driving this fan is equipped with an automatic starter and is operated by means of suitable push buttons located in the locker room adjacent to the hair drying apparatus. This equipment will accommodate approximately 100 pupils per hour.

All toilet rooms are ventilated by means of an exhaust system, the two fans used for this purpose being located in the basement fan rooms, delivering the air through roof ventilators. The kitchen, cafeteria, chemical laboratories and domestic science rooms are equipped with separate exhaust systems, similar to that provided for the toilet rooms.

The direct radiation in general is

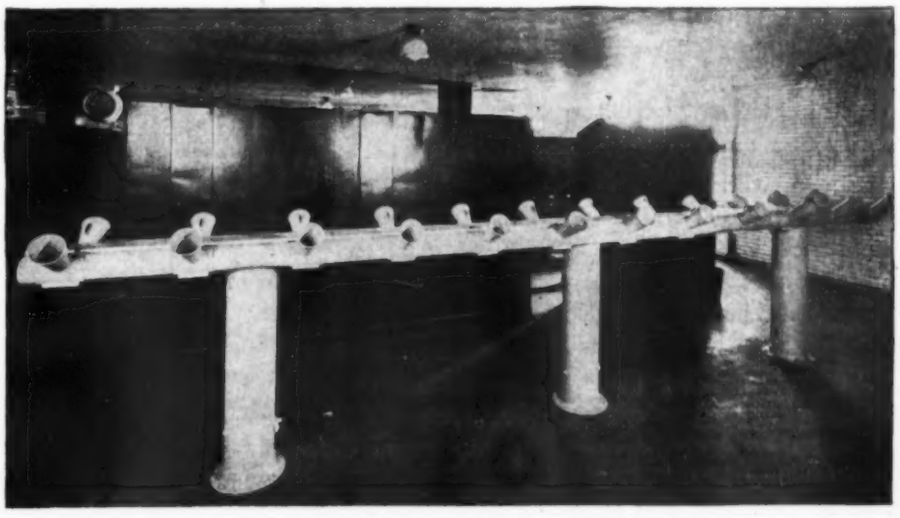


Figure 8. Hair Dryer.

located around the exterior walls beneath the windows. All radiators are equipped with metal shields (Figure 7) to protect the pupils seated nearest the radiators from the radiant heat. All temperature regulation is accomplished by controlling the direct radiation, the temperature of air supplied to the rooms being maintained constant at approximately room temperature. Diaphragm motors are used for controlling all dampers in connection with the ventilating system. These are operated by means of pneumatic switches placed in the fan rooms and the air supply for the same is taken from the compressed air system provided in connection with the temperature regulation equipment.

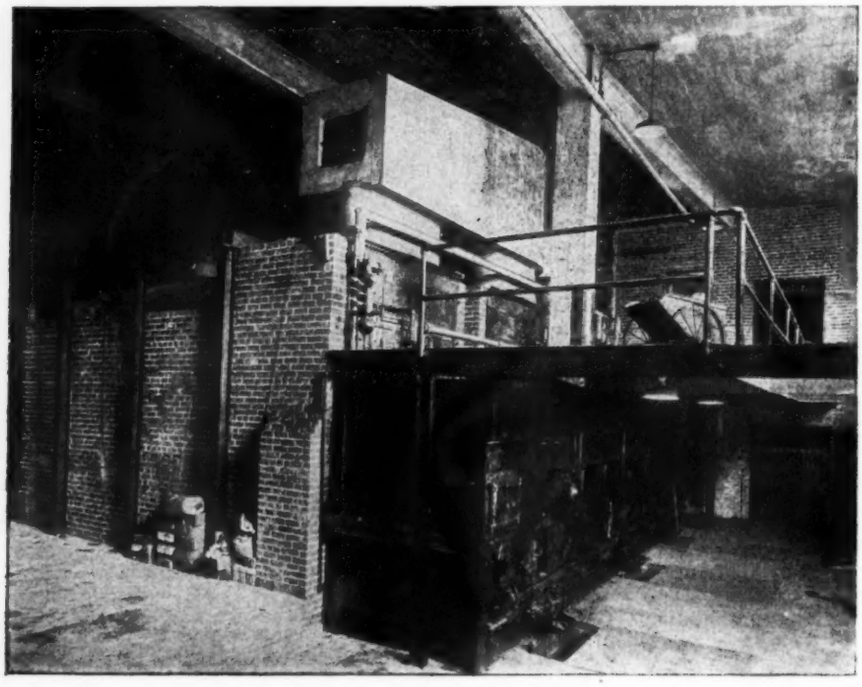


Figure 9. Boiler Room.

The boiler plant is located at the rear of the building with a floor level approximately 10 feet below grade. The fuel room floor is at the same level and the coal is admitted directly from the trucks through manholes into the fuel storage. A 1000 pound capacity electric platform hoist is provided for elevating the coal in charging barrows from the coal room level to the firing platform, which is approximately 10 feet above the boiler room floor. This hoist is also used to elevate the ashes from the boiler room floor level to grade. Three 150 horse power return tubular boilers with dutch oven settings and natural draft automatic stokers are installed for providing steam to the plant. The firing is automatic, the coal being dumped directly from the elevated firing platform, Figure 9, to the tops of the dutch oven furnaces of the stokers.

The large main supply fans are driven by low pressure engines and exhaust through oil separators into the heating system. The boiler plant is designed to operate at approximately 40 pounds pressure and this pressure is used for operating the fan engines. The fan coils and direct heating system are operated at low pressure by means of pressure regulating valves.

Discussion.

PRESIDENT MCCOLLS This paper is open for discussion now. Mr. Anderson is willing to answer any questions asked him.

H. M. HART: At what velocity is the air introduced through ceiling registers into classrooms?

PRESIDENT MCCOLL: The velocity of entering air is about 90 feet per minute. That rate was established experimentally as follows: Some of us with rather thin hair on top stood under the outlets to determine how high a velocity we could have without feeling uncomfortable No discomfort was experienced with an air velocity at 90 feet per minute, so we designed the system with that limit.

W. H. CARRIER: Have any tests been made with higher velocities or to reduce the effective velocity a short distance from the outlet?

PRESIDENT MCCOLL: The air is given out in a pyramid with an angle of about 30 degrees each way from the vertical. The velocity leaving the outlet is higher than 90 feet but the average velocity from the outlet to the floor is about 90 feet per minute.

MR. CARRIER: Does that include the effect of the diffusion?

PRESIDENT MCCOLL: Yes.

MR. HART: Do I understand that the 90 foot per minute flow is not the outlet velocity at the register?

PRESIDENT MCCOLL: Your assumption is correct, Mr. Hart.

MR. HART: My question was, what is the velocity from the register?

J. W. SNYDER: The velocity of air is 250 feet per minute from the register.

MR CARRIER: Was there any test made as to what part of the velocities occured at say a breathing level for the room, if the average velocity is 90 feet per minute.

PRESIDENT MCCOLL: No test was was made.

MR. CARRIER: Was the anemometer used?

PRESIDENT MCCOLL: No, you would have to use smoke, as in Dr. Hill's test.

MR. CARRIER: I think that would be a good place to test the hot-wire type of anemometer for cooling effect on various portions of the room.

MR. HART: What temperature of air is used in the hair dryer?

MR. SNYDER: About 100 to 120 degree Fahrenheit.

PRESIDENT MCCOLL: The capacity of the hair dryer in the Barbour School is 150 girls per hour, al-

though the paper said 100 girls. When the girls have bobbed hair, the capacity is increased.

MR. HART: What velocity of air is used in the hair dryer?

MR. SNYDER: The volume is 100 cubic feet per minute through each outlet. The funnels are 4 inches in diameter, at the outlet and 3 inches in diameter at the throat.

MR. MEYER: Do you ever attempt to use but one boiler and dispense with standby equipment? In Minneapolis we have designed quite a number of schools for economy, putting in one boiler, based upon 120 per cent of the maximum boiler rating, and it has given satisfaction. I wonder what your practice is here. Do you install duplicate boiler equipment?

PRESIDENT MCCOLL: Always.

MR. MEYER: What boiler rating do you take for your minimum temperature? You design for zero here, don't you?

PRESIDENT MCCOLL: Yes, and at 140 per cent rating.

MR. MEYER: Do you use stokers?

PRESIDENT MCCOLL: Yes.

Menk Sees Fans as Great Forward Step in Residence Warm Air Heating.

He Points Out Mistakes in the Past and Cautions Against Use of Small Furnaces.

IN the following, R. W. Menk, former President of the Western Warm Air Furnace & Supply Association, discusses the great possibilities for the installer by the introduction of fans in connection with residence furnaces:

Many furnace manufacturers and installers are beginning to realize the very great advantages of attaching fans and blowers to warm air heating systems.

Fans and blowers, of course, have been used for many years in combination with warm air furnaces on the larger types of installations but opportunity is now knocking again at the door of industry advocating fans and blowers on the smaller warm air furnace, and those who are hearing her are realizing more and more the immense possibilities that the fan and blower offer.

The great advantage of the fan or blower is to overcome the difference in weight of the cold and warm air and to cause the entire air in the building to circulate in a natural manner, thereby overcoming the cold air pressure and not only heating the building more quickly, but preserving the life of the heater. As soon as the air has had an opportunity to gain the velocity the fan is capable of giving it, the fan may be shut off and it will require several hours before the velocity of the air has again dropped back to normal circulation.

The reason for some past failures as I see it, was that they tried to blow air into the casing in a way that when a certain pressure or resistance was created the air would back up at the sides of the duct and was again blown into the casing, churning the air.

To illustrate my point, let us assume a cold air shoe sixteen inches deep and forty inches wide into which we place a twelve or fourteen-inch propeller fan. We start the fan and as the air is being drawn down into the cold air duct and blown into the casing by the fan, it strikes ashpit of the furnace and as the air accumulates in the casing it is easier for a portion of the air which strikes the ashpit to return back into the shoe along the side of the fan, therefore not getting the maximum air delivery that the fan was able to furnish.

This condition, of course, can be easily overcome by putting dampers at the side of the fan but this involves a hazard to the furnace, if the dampers are to be hand operated, on account of the possibility of the attendant forgetting to change the dampers which, if forgotten when the fan was stopped, would not allow sufficient air to circulate over the furnace and would naturally injure the castings. Therefore, any device that is not automatic with the fan should not be used or advocated.

Another condition that arose was the injury of the motor. If the fan was hung in the shoe too close to the furnace the rays from the firepot heated up the fan and motor to such an extent as to melt or dissolve the insulation in the motor and cause it to be burned. This was especially true after the fan had been stopped and the firepot of the furnace was still red hot.

There are at this time several styles of fans outfits on the market that I am told are giving excellent results and from what I can learn, overcome the conditions just alluded to. The outfits I refer to do not, however, meet all the conditions that arise on a warm air job or in other words, are not universal.

Suppose there are two or three cold air returns from different parts of the building. How will it be possible to make them all function properly without the necessity of two or three fans? There are three ways, as we see the situation: Combine all of the returns into one duct or cold air room, which often is not convenient to do; increase one of the ducts to the full area of the warm air leader pipes; or use a certain patented device now obtainable for any make of furnace at a moderate cost.

The suggestion may arise in your mind to put dampers in the other ducts and to draw all of the air that supplies the furnace through one duct. This method can, of course, be used and the dampers could also be operated automatically with the fan but the circulation will not be nearly so satisfactory and if the duct that the fan supplies is to one side of the furnace, the distribution of air in the casing will not be nearly so uniform.

I believe that what I have said will give you a fairly clear conception of what is necessary to obtain best results.

As we see the situation it is possible to get three times the capacity out of a fan job as against the average gravity job and here is where I want to caution everyone who hears or reads this statement. Don't put in a small furnace and expect it to do the work of one that should be two or three sizes larger, for it will not only run up the cost of the electrical energy but the rapid burning of fuel will involve more frequent attention and will increase the fuel consumption on the average job to the extent that the added difference in the original cost between the smaller furnace and the proper size for gravity work will be nearly consumed in one season. Please get this firmly fixed in your minds and advocate the proper size furnace if you want to see that warm air gets its just dues, and I am sure you will after giving it full consideration.

Furnace Prices Are 20 Per Cent Lower Than in 1920 but Are Rising Again as Costs Go Up.

Questionnaire Sent Manufacturers Develops That Prices Are 63 Per Cent Over 1914, 27 Per Cent Over 1917.

FURNACE prices are approximately 20.4 per cent lower than they were in 1920, but they are gradually stiffening again, due particularly to the advances in pig iron and coke.

This figure is based on a questionnaire sent the leading furnace manufacturers of the country. Not all were willing to comment on price conditions or supply figures, but of the leading twenty-five, selected as most representative of the industry, there was shown a marked similarity of price trends.

These same manufacturers reported an average of prices 63 per cent in excess of 1914 prices, and approximately 27.8 per cent above 1917 figures.

The reductions in the 1920 prices, as now prevailing, ranged from 8 per cent to 38.6. These same manufacturers reported that their 1922 prices were from 15 to 100 per cent above 1914 prices and from 10 to 90 per cent above 1917 prices. Some of the characteristic responses were:

"Prices are much lower than they were in 1920, but, of course, considerable higher than the pre-war period. What they will be in the future will, of course, depend upon the cost of materials and labor. At the present time, materials are, at least, 50 per cent higher than they were in January last, so that it is plain that an increase in furnace prices will probably have to be made.

A New Jersey manufacturer replied as follows: "During spring prices were 10 per cent lower than in 1920, but are now the same as 1920, due to the advance in pig iron and coke." Other replies were:

"Twenty-five per cent lower up to October 5, 1922; now 15 per cent lower."

"Today's price is 71.4 per cent of the 1920 price."

"Our present prices are always based upon present costs and have no bearing whatever on either past or future prices."

Chart Showing Size of Pipes for Warm Air Heating.

The accompanying chart gives an easy method by which the installer can quickly find the size of basement pipes and wall risers for the various sized rooms on the first and second floors of a residence.

The figures at the top indicate width of room, while those at the right are for the length, in feet.

Note where the intersection of width and length lines fall. The sizes of the pipes and risers are indicated by the capital letters within the heavy zig-zag lines, and these letters correspond with those in the following table:

A.—First floor, 8 inch basement pipe; second floor, 8 inch basement pipe and 3½ x 10 inch riser.

B.—First floor, 9 inch basement pipe; second floor, 8 inch basement pipe and 3½ x 11½ inch riser.

C.—First floor, 10 inch basement pipe; second floor, 10 inch basement pipe and 3½ x 11½ inch riser.

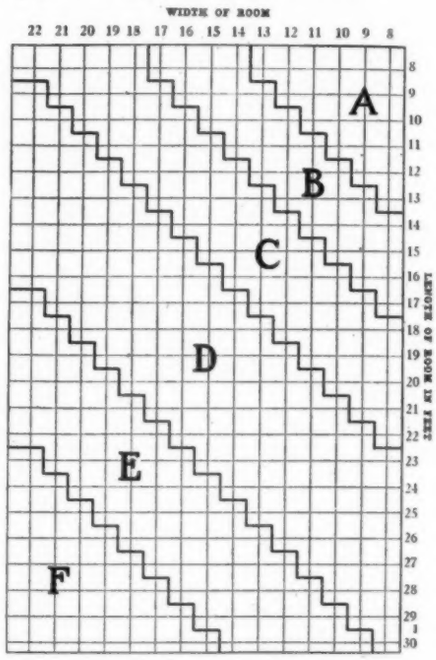


Chart for Pipe Sizes.

D.—First floor, 12 inch basement pipe; second floor, 10 inch basement pipe and 5 x 14 inch riser.

E.—First floor, 14 inch basement pipe; second floor, 12 inch basement pipe and 8 x 14 inch riser.

Rooms from 8 to 15 feet in width are assumed to have ceilings not over 10 feet high; rooms from 15 to 22 feet wide not over 12 foot ceilings.

The information in the foregoing and the chart are shown by the courtesy of the Utica Heater Company, Utica, New York.

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Railroads and steamship lines that ever become successful are constantly seeking for a means of improving their service and adding comforts for the passenger.

Too many merchants permit themselves to be content with the old condition of affairs. It is never safe, especially with those who employ advertising.

Simple and Direct Newspaper Advertising Appeals, with Illustrations and Prices, Sell Furnaces.

Selling Points Should Be Stressed By Proper Use of Type With All Over-Crowding Avoided.

ON THIS and the succeeding pages of this article will be found a series of advertisements intended to sell furnaces on the part of the retailer.

In selecting these ads, no attempt has been made to choose either the most compelling selling appeals, nor the poorest, but rather to obtain the average retail furnace-selling ad, or perhaps a little above the average. It is the belief that a study of this type of ad will be most beneficial to the retailer, since it more nearly represents his capabilities and limitations. The genius is not taken into consideration here, on the theory that if we all were geniuses we wouldn't be selling furnaces or writing about them.

Are You Going To Have GOOD Heat This Winter?
Install A
MAJESTIC
Down Draft Furnace
The great success of the Majestic Down Draft Furnace is largely due to the construction of its radiator. This radiotar has been thoroughly tested for the past eighteen years and has proved itself one of the most economical features ever embodied in furnace construction.
The Majestic radiator has twenty-two feet of smoke travel as compared with eight to ten feet in the ordinary type. This extra long smoke travel allows the Majestic radiator to utilize all the heat of the smoke and gases, increasing the heating capacity of the furnace without burning more coal.
The Majestic Down Draft Furnace is easily cleaned as it has two cleanout doors, one in the front and one at the side. The side cleanout is interchangeable to either side of the furnace. The Down Draft pipes contain no dead corners for soot to collect as all bends are circular. Equipped with a direct and indirect damper operated from the front aids materially when starting a fire.
Ashbaucher's Tin Shop
116 North 1st street
Phone 739

Figure 1. Type Arrangement in This Ad Pleases the Eye.

Let us begin with the advertisement of Ashbaucher's Tin Shop, shown on this page, as it appeared in the *Democrat* of Decatur, Indiana. The whole appearance of this ad is pleasing to the eye and leads one to suspect that advantage has been taken of some of the manufacturers' professionally prepared copy. (Parenthetically, live dealers will always take advantage of these advertising suggestions. Save all typed ads sent you and adapt them to your local advertising. Remember they are prepared by experts—men who know all about type faces, borders, rules, display psychology—and also remember that they know, or should know, more about the particular furnace than you do.)

"Are you going to have GOOD heat this winter?" is the challenging query at the head of this ad—a question every householder asks as he scans the almanac and surveys the coal price list. Then is given the buying suggestion, "Install a Majestic Down Draft Furnace."

In small type the prospective buyer is given three concrete reasons why he should buy this particular furnace—the radiator, the long smoke travel, the cleanout features—all good talking and selling points, and given admirable type display here.

What this ad lacks is to be found on the next page in the display of the Knabe's Hardware Store as published in the Sterling (Illinois) *Gazette*. This concern, it will be observed, conducts a sheet metal works and manufactures furnaces. Many a stove-heated home wants a furnace, not only for comfort but also for style, so this ad very cleverly eliminates the most common objection—that is, the cost—not the cost of installing the furnace, but the cost of upkeep.

"Ten cents a day will heat your home," says the graphically presented salesman in this ad. This is a direct, unequivocal statement of fact. It is a real basis of computation for the man who is debating the installation of an all-house heater. Reading further he learns this is for "pipeless furnaces," "as good as any on the market," and he is admonished to "note the low prices." Four prices are furnished —$105.50, $118, $135 and $153— depending on the size of the pipe and including, it will be noted, the cost of installation. Attention should also be called to the large plain type used to designate the prices and to the friendly suggestion at the bottom to "Come in and Talk It Over."

The art illustration at the bottom of the cut neither adds to nor detracts from the subject matter, but a review of the ad would not be complete without calling attention to the plain bold lettering used in the firm signature—the same, by the way, as is used in the caption of the cut.

In Figure 3 is reproduced an ad of the Nelson Tin and Furnace Works as reproduced in the Council Bluffs (Iowa) *Nonpareil.*

"Furnaces!" is the focal appeal of this ad. "Furnaces for your home," and you are reminded to "Specify Sprague or Torrid Zone Furnaces," the product of this maker. The principal selling point of the article is to be found in the manufacturer's guarantee as follows:

"Manufacturers' guarantee of any part of either furnace giving out within five years of purchase will be replaced, f. o. b. factory, free of charge. If any part gives out within ten years from date of purchase we will replace same at one-half price, f. o. b. factory. Grates are the only part exempt from this guarantee."

But here is still a better selling point—"Over 1,500 in Use in the City!"

The ad also shows a cut of one of the furnaces, though not specifying which, and in the reduction, herewith, the value of the cut to the ad is not realized.

"Call Us for Estimates" is the footnote farewell of this selling appeal and inclines the writer to wonder why some furnace makers and installers don't start out with this suggestion in order to find likely prospects, and trust to making a sale after furnishing the estimates.

In Figure 4 is reproduced a small ad placed by William C. Krunn-

10¢ a day will heat your home
Pipeless Furnaces
Here are furnaces just as good as any on the market and
Note the Low Prices
All Cast Pipeless Furnace, 20 inch, installed 105.50
All Cast Pipeless Furnace, 22 inch, installed $118
All Cast Pipeless Furnace, 24 inch, installed $135
All Cast Pipeless Furnace, 26 inch, installed $153
Come in and talk it over.
Knabe's Hardware Store
And Sheet Metal Works
209-211 First Ave., Rock Falls

Figure 2. Appeal of Low Fuel Cost Stressed Here.

fusz, furnace dealer of Elgin, Illinois, in the *News* of that city. "Let Us Install an International Hot Air Furnace for Steady Heat and Low Fuel Bills," says Mr. Krunnfusz to the prospective furnace buyers of his community. "You'll take comfort this winter with an International."

"Well said," Mr. Krunnfusz, and the inline sketch of the furnace is well drawn and well placed. Steady heat and low fuel bills are two good selling points for any man's furnace. But they are not stressed enough. Suppose, for instance, they had been placed at the top of the ad so as to read: "For Steady Heat and Low Fuel Bills, Let Us Install, etc.," would it not have made a stronger selling appeal?

Mr. A. T. Kincaid, the "Warm Air Heating Contractor" of Springfield, Illinois, as he hails himself, is a believer in a bold, heavy black type, and the writer is inclined to agree with him particularly in a removal notice such as he published in the *Journal* of his city, which we reproduce here.

"Notice!" arrests the attention of the reader. "The New Home of the Weir Furnace Is Now Located at, etc.," giving the address. It is agreeable to note that Mr. Kincaid has stressed the name of his furnace in the largest type. This is essential. "Store name" and "store identity" are important, but there are many ways to stress them. Give the firm name the same position in the ad or give the ad the same position in the newspaper, or use a special or hand lettered type, and place it in all advertising and literature—these are many suggestions to build up "store identity."

FURNACES
FOR YOUR HOME
Specify Sprague or Torrid Zone Furnaces.
Manufacturers' guarantee of any part of either furnace giving out within five years of purchase will be replaced f. o. b. factory free of charge. If any part gives out within ten years from date of purchase we will replace same at one-half price f. o. b. factory. Grates are the only part exempt from this guarantee.
Over 1,500 in Use in the City.
NELSON TIN & FURNACE WORKS
13 South Main.
Phone Black 2749.
Call Us For Estimates.

Figure 3. Manufacturers' Guarantee Is Selling Appeal.

Let Us Install An
International Hot Air Furnace
For Steady Heat And Low Fuel Bills
You'll take Comfort this Winter with an INTERNATIONAL
WM. C. KRUNNFUSZ
10-12 Douglas Avenue
Phone 177

Figure 4. Good Selling Points But Not Emphasized.

Mr. Kincaid was not content to use bold, black type for the body of his ad, but carried the idea to the heavy borders surrounding it.

The use of the bold, black type in this instance is entirely justified. It should be used on such an occasion and it should never be used otherwise—for just the reason that sometime there will come a time when nothing but big, bold type will satisfy the occasion, and then never having abused its use, it becomes available.

In Figure 6 is reproduced an ad prepared and published by Ralph

D. Giarth in the Altoona (Pennsylvania) *Mirror*. This is a well displayed ad, with one possible exception—the firm name is displayed in such large type that the ad is thrown slightly out of balance.

The cut of the Wise furnace fits in well with the body type, as does the owl figure which constitutes the well known trademark of this product. "Buy a Nationally Known Wise Furnace" is a good buyer's admonition and backs up the national advertising. Equally important is this suggestion:

"The Wise Furnace is well known in every part of the United States, being made by one of the biggest manufacturers in the world. It is known everywhere as a product with no superior in its heating quality, ease of operation or lasting power of durability."

The ad of A. J. Helfrich, which appeared in the Galion (Ohio) *Inquirer*, has especial appeal because of its simplicity. The caption—"A Word With You"—has a timely illustration in a young married couple, presumably about to install a furnace, being shown one by the obliging salesman. The text of the appeal is equally direct and

Figure 5.—When Bold Type and Border May Be Used.

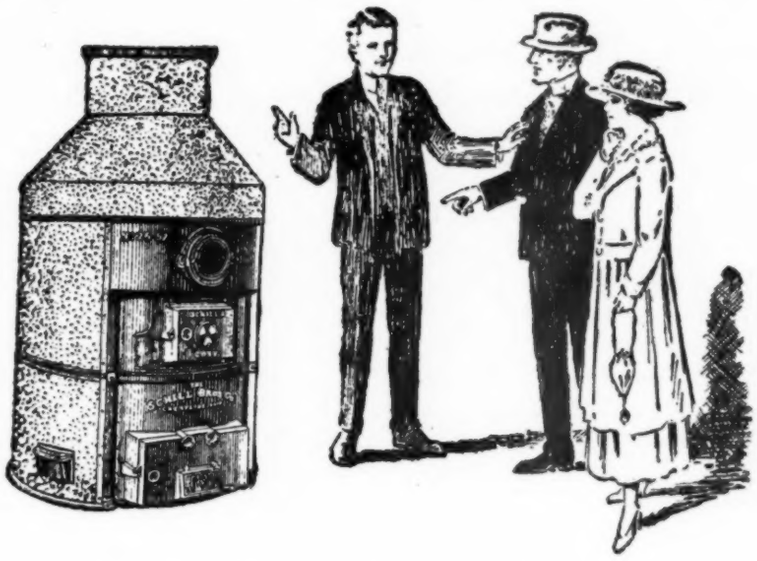
WISE
Buy a Nationally Known
WISE FURNACE
The Wise Furnace is well known in every part of the United States, being made by one of the biggest manufacturers in the world. It is known everywhere as a product with no superior in its heating quality, ease of operation or lasting power of durability.
See Them On Display
RALPH D. GIARTH
522 Sixth Avenue, Altoona, Pa.

Figure 6. Excellent Cut Arrangement "Makes" This Ad.

forceful: "If you are deciding now to install a Furnace for winter use, it will be wise to consult us, since we install the Schill and get done the same day you place your order with us."

It will be noted that we have slightly altered the text as it appears in the ad, to correct a typographical error. The change from "one" to "done" completely alters the sense of the words and illustrates again how necessary it is to keep a careful check on ad proofs to prevent such mistakes.

The best pointer about the ad of A. W. Lensing, reproduced here from the *Oak Parker* of Oak Park, Illinois, is the splendid, clear cut of the furnace itself. In the true sense of the word this is not a furnace ad, but is a general business ad of Mr. Lensing's lines, which include general hardware, builders' hardware, paints, and painters' supplies.



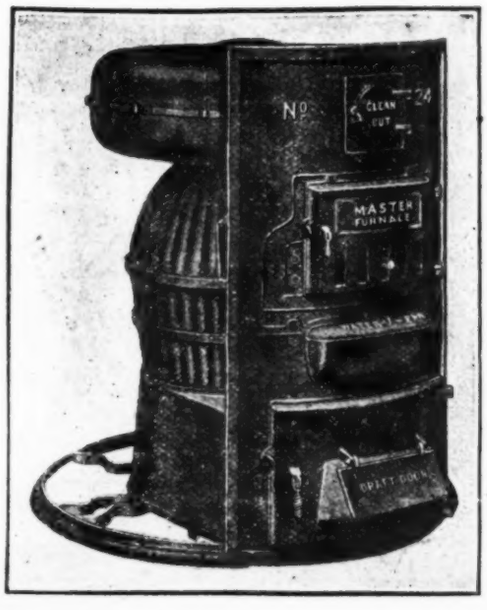
A Word to You

IF you are deciding now to install a Furnace for winter use, it will be wise to consult us, since we install the Schill and get one the same day you place your order with us.

A. J. Helfrich

Plumbing and Heating Lincoln Way East

Figure 7 (Above). Ad Made Effective by Simplicity of Appeal. Figure 8 (Below). Type of General Business Ad.



A. W.

LENSING

MASTER FURNACE

General Hardware
Builders' Hardware,
Paints and Painters'
Supplies, Furnaces and
Sheet Metal Work.
Slate, Tile and
Asbestos Roofing

6633 12th Street

Phone O. P. 2382

furnaces and sheet metal work, slate, tile and asbestos roofing.

The ad of Joseph Stagg, which appeared in the *Signal* of Middleton, Ohio, is a good example of how an ad may be made to say something even though space is limited. "Now," is the timely appeal of this ad, "is the time to have your furnace repaired." Mr. Stagg brings out the point that he is in the furnace repair business; also that he is agent for two well known makes—the "Front Rank" and the "Montcrief"—and he closes with his business address and telephone.

NOW

Is the Time to have your

FURNACE REPAIRED

We Repair all Makes of FURNACES

Agents for "Front Rank" and "Montcrief" FURNACES

Jos. Stagge

629 E. Third St. Phone 187

Figure 9. Sample of Effective Ad in Small Space.

And all of this information, including a small cut of a furnace, is included in a relatively small space, which has been achieved without the appearance of "crowding."

Set Your Goal and Strive to Get There.

Every day has possibilities all its own. Possibilities to learn; possibilities to make friends; possibilities to plan for a more resultful tomorrow. We seldom reach, however, what we do not conscientiously set out to achieve. So let's know what we are after today and tomorrow—and proceed to get it.

No one has ever succeeded in building a safety blade for price-cutting.

Practical Helps and Patterns for the Tinsmith.

Aids to the Improvement of Craftsmanship and Business. News from Various Branches of the Sheet Metal Trade.

Use of Hip Angles.

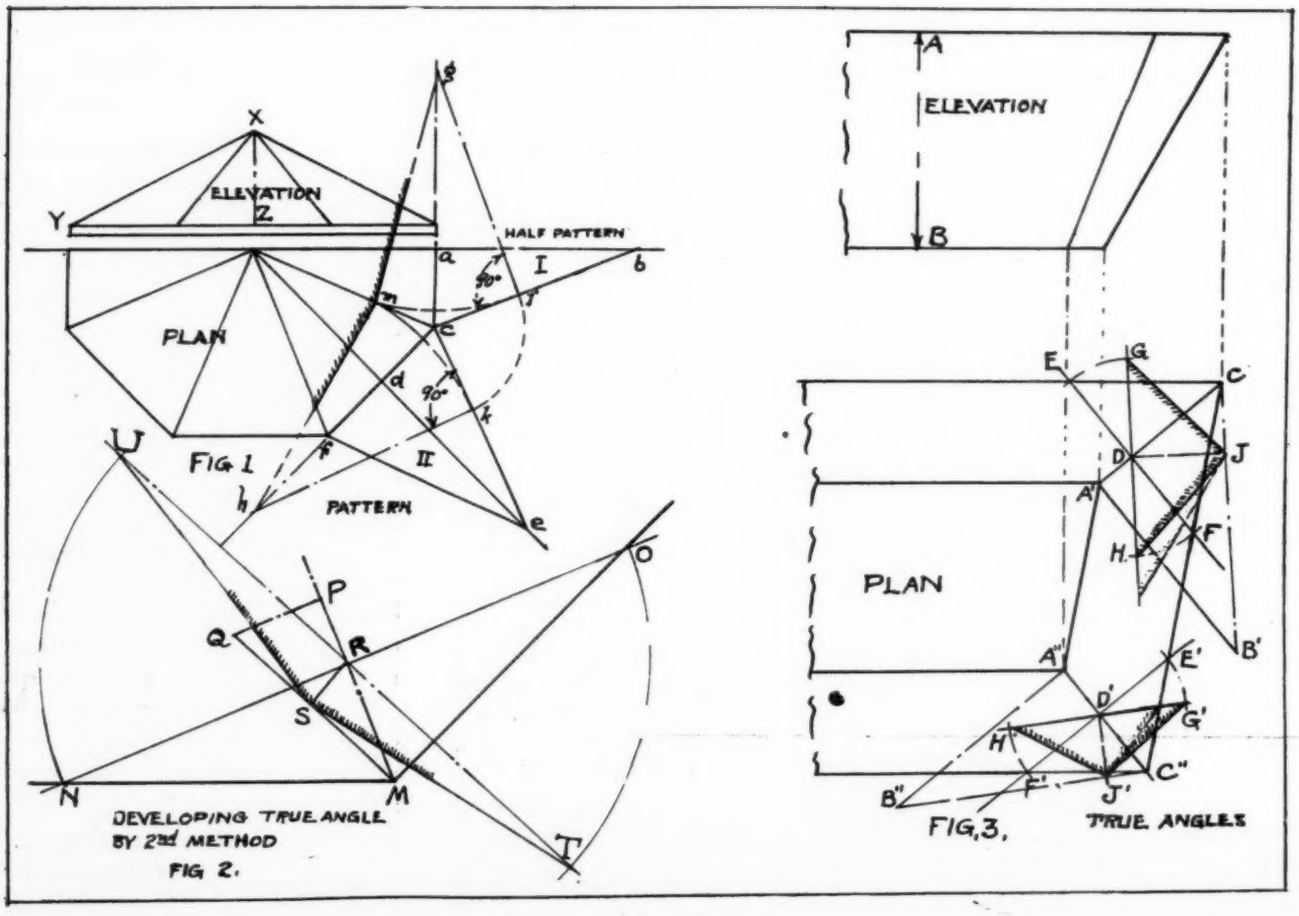
By O. W. Kothe, Principal, St. Louis Technical Institute, St. Louis, Missouri. Written especially for American Artisan and Hardware Record.

The finding of true angles through hip lines of various designs as covers, hoppers, pipes, etc., is very important, and is also a part of descriptive geometry, extended to a more practical application. In figure 1, we take on the development of the angles in the hip of a pitch cover made to an octagon. The plan shows the half octagon, while the elevation shows the rise with X-Z as center height. Now one manner of developing true angles is shown in connection with this plan.

The first step is to lay out 2 patterns directly from the outline of plan. So we pick the side line of cover X-Y, and we set them as a-b and d-e in pattern I and II. Then we draw the slant lines c-b, also c-e and f-e. This will give the separate patterns for each octagonal segment. The next step is to set dividers to any radius, and using c as center, describe an arc as j-k. Then from these points square out lines to right angles to their base lines, or 90 degrees, to intersect the extended plan lines in points g and h. Now use h or g as center, and k or j as radius, and describe an arc to the hip line of plan as in point m. Then draw line h-m-g, which is the true angle for the hip. This hip would have to be bent to this shaded bevel.

The same result is produced by a different treatment as in figure 2, which M-N-O is the angle of outline of plan, or the octagonal angle in this case. Then M-P equals the central miter line and also is the length of one of the miter lines in plan. From P square out equal to the rise X-Z as P-Q; then Q-M-P will be the true diagonal section through hip. At any place at R draw a line square to miter line M-P until it intersects the outlines in point N and O. After this, draw a line as U-T through R so that it is parallel with the hip line Q-M. After this, square a line at right angles from R to N-M as R-S. Now use R as a center and N and O as a radius, describe arcs to the line P-U. Then the angle T-S-U will be the true bevel through the hips of our cover. This method may be a little harder to see through than the above method, but it permits a wider range of application.

Then at figure 3 we show another



Patterns for Hip Angles.

treatment for hip lines of a pan, where it is the desire to have the true bevel of the angles in the hips, A-C-C″-A″. Here this treatment is repeated as shown in figure 2, and hence needs no further comment.

St. Louis Sheet Metal Men to Install Officers January 6.

The thirteenth annual banquet and installation of officers of the Sheet Metal Contractors' Association and the Sheet Metal Consumers' Protective Association of St. Louis will be an event at the Hotel Claridge, January 6, 1923, at 6 p. m., according to a unique announcement sent to AMERICAN ARTISAN AND HARDWARE RECORD by Julius Gerock, Jr., president of the Gerock Brothers Manufacturing Company.

The new officers were nominated December 19, when rival "wet" and "dry" slates were voted on by the membership and the following "all-wet" set of officials chosen:

President—Henry Stark.

Vice president—E. Grenzebach.

Secretary—L. R. Schlier.

Treasurer—A. P. Faessler.

Sergeant-at-arms — D. Richardson.

Mr. Gerock, who is one of the live and popular sheet metal men of the Mound City, modestly signs himself "a defeated candidate" on the "dry" ticket, and reminds that the victorious ticket will have charge of the convention at St. Louis next June.

What Repair Man Needs to Know About the Automobile Radiator.

E. E. Zideck Explains What It Is, What It Does and How It Works.

Written Especially for AMERICAN ARTISAN AND HARDWARE RECORD by E. E. Zideck, Chicago.

Lesson 4.

The Radiator and its Parts.

THE upper tank of the radiator is provided with a *filler tube* through which to replenish the water in the radiator. This filler tube is closed by a *cap* which either is screwed on or is snapped over into a lock. The cap usually has a thermometer inserted in its center to show the temperature of water in the radiator.

Inside the *filler tube*, extending up to where the cap closes it, is an overflow pipe of small diameter, which runs through the bottom or rear wall of the upper tank and bends over to the side of the core and runs parallel with it to the bottom of the radiator.

The *overflow pipe* is there to carry away steam and the surplus of water produced by its boiling within the tank.

Questions.

1. By what means is water replenished in the radiator?
2. What name applies to the tube on top of a radiator?
3. How is this tube closed? By what?
4. If there is a thermometer on the radiator, where is it situated?
5. Why is there a thermometer?
6. What is the pipe called which is placed inside the filler tube?
7. Why is it there?
8. How does it run to the bottom of the radiator?
9. If water boils in the radiator, where does the steam escape?
10. Should the overflow pipe be open or closed?

The Lower Tank.

The *lower tank*, or the *bottom tank*, as it is called, is provided with a *drain cock* for letting out the water in freezing weather and when pure water is substituted for the water long in use.

There are also *bolt plates* upon the lower tank which hold bolts attaching the radiator to the frame of the automobile.

A few of the radiators fasten to the frame by brackets in the shell.

Questions.

1. What is a *drain cock* for on a radiator?
2. What should be done to the radiator when the motor stands still and freezing weather sets in?
3. What happens in freezing weather if water is left in the radiator with the engine standing still?
4. Why are there *bolt plates* on the lower tank?
5. How is the radiator fastened to the frame of the automobile?

Minor Attachments.

Aside from the *hot water inlet, filler tube with cap* and the overflow pipe of the upper tank, there are minor attachments to it to hold the *hood* in position and to fasten the radiator to the shell.

Similar minor attachments there are in some cases upon the lower tank. The *cold water outlet* and the *drain cock* are, however, the only parts of the lower tank holding water and liable to leak.

Questions.

1. What is a *hot water inlet* in connection with a radiator?
2. Where is it situated?
3. With what is it connected?
4. What are the three main parts of the upper tank?
5. What are the water holding parts of the lower tank?
6. What other minor parts are there of the tanks?
7. Do tanks do the *cooling?*
8. What part of the radiator does the cooling?
9. In what relation are the radiator tanks to the cooling part?
10. Where does the hot water gather upon coming from the engine jackets?
11. From where do the engine jackets receive their water supply?

12. What is the purpose of an overflow pipe in a radiator?

13. Where is the drain cock situated on a radiator?

14. How is the radiator fastened to the frame of the automobile?

Materials Used in a Radiator.

The tanks and their parts are made of heavier material than is the core.

The *inlet* and *outlet* are usually cast iron or brass. The *filler tube* is heavy brass. The *overflow pipe* is a copper tube of good thickness. The *drain cock* is cast brass. The bolt plates and other minor attachments are also of good thickness.

All of these parts, except the drain cock in some cases, are *riveted* and *soldered* on to the tanks.

Questions.

1. How are the parts of the radiator which are of *heavier material* fastened to the tanks?

2. Which parts of the radiator are riveted and soldered on to the tanks?

3. Of what are the *inlet* and *outlet* made?

4. Which *material* is mostly used on tanks and their parts?

Learn NAMES and OBJECTS of tank parts thoroughly before proceeding further.

Review.

Write correct answers to the following four questions.

a. What is the *upper tank* of the radiator for and what are its main parts?

b. What is the *lower tank* of the radiator for and what are its main parts?

c. What parts of the upper and the lower tanks hold water and are liable to leak?

d. Of what materials are made the tanks and their various parts and how are these fastened to them?

(Lesson 5 follows next week.)

Zinc Roofing Resists Fire and Lightning.

Preventable fires in the United States have reached the appalling cost figure of $1,500,000 every twenty-four hours, say the National Board of Fire Underwriters, and there is a lesson in this for the zinc industry, asserts the American Zinc Institute. The idea is dwelt on in a recent bulletin as follows:

While certain forms of roofing are in many places given a fireproof rating by the Board of Fire Underwriters, they are, of course, far from being fireproof.

But the lightning-proof quality of properly grounded metal roofs accounts in no small measure for the fast growing use of metal roofing on farm buildings throughout the country.

A practical test of lightning on metal roofs, as compared to other forms of roofing, is being demonstrated by equipment at Baltimore, Maryland, installed through the interest in the subject of Mr. Edgar Lyon, of the Lyon-Conklin Company, of that city.

The International News Reel Corporation featured this test in its Weekly News Reel shown in thousands of moving picture theaters throughout the country during August. The picture bore the following description:

BALTIMORE, MARYLAND.
Miniature lightning sets toy house ablaze.
Hazards in unguarded roofs vividly illustrated before Governor Trinkle, of Virginia, and other fire prevention leaders.
Showing how the bolt strikes and starts the blaze if the bolt has no place to go.
Showing how the lightning, hitting a metal roof, is made harmless by proper grounding.

The attention of the Secretary of the Institute was called to this reel by Mr. C. H. Stewart, Secretary of the American Zinc Products Co., and he was privileged, through the courtesy of Mr. Hearst, to view the picture in the New York studios of the International News Reel Corporation.

AMERICAN ARTISAN AND HARDWARE RECORD is advised by William J. Gardner that he has sold his sheet metal business at Fall River, Kansas, to J. L. Fettor.

Pittsburgh Sheet Metal Men Hold Fine Annual Meeting.

The following is an interesting report of the recent meeting of the Sheet Metal Contractors' Association of Pittsburgh and vicinity, supplied AMERICAN ARTISAN by Secretary E. W. Scarborough:

The meeting was called to order at 6:30 p. m. in the Assembly Room at the Fort Pitt Hotel. The Commissary Committee, consisting of Hartzell, Scholes, Fortenbacher and Scarborough, were responsible for the fine dinner served. Frank Wilberding of the Ferbort-Schorndorfer Company and George Johnston of McClure-Johnson Company remembered the boys with some fine cigars, and the room was filled with the smoke of appreciation and good fellowship.

The results of the election were as follows:

President, Louis Luckhardt; first vice president, W. C. Markle; second vice president, D. E. Kendig; secretary, E. W. Scarborough; treasurer, W. J. Fortenbacher. Vacancies in the Board of Trustees were filled, and a Conference Committee was also elected.

Short talks were given by several of the jobbers present. We heard from Angermyer on association work, as usual; and Mr. Keighley gave a very interesting talk on the reorganized Building Trades Employers' Association.

The meeting was well attended, there being forty places set, and all agreed that it was a big success. President Luckhardt thanked all the officers and members for their support during the past year, and made a very forcible appeal to each one present to attend the meetings more regularly.

Who Must Make New Sheet Metal Workers?

President N. A. Lichty, of the Iowa Sheet Metal Contractors' Association, in the following article points out the necessity for more attention and active effort being given toward the making of additional really experienced sheet metal

journeymen and suggest a means by which this object can be accomplished:

Help! Help!

That is what we all have been crying the last three or four months. We could not get enough help following the signing of the Armistice, then the depression came on and we just naturally thought we never would need more help than we could get but here we are again—short about 400 sheet metal workers in the state of Iowa alone.

Well what are we going to do about it? Where are we going to get more Sheet Metal Workers? If there is no more and nobody makes any more, then where will wages go? If no one makes any more sheet metal workers there won't be enough to do the regular work and substitute materials will soon take the place of sheet metal in many cases.

A shortage of sheet metal workers will curtail the expansion of the entire industry which offers many opportunities because of the shortage of wood and other materials for the many articles that can be made of sheet metal. The possibilities in the sheet metal industry are unlimited and it is strictly up to us sheet metal contractors to make our own workers and quit hoping and expecting that someone will do it for us. It's our job, let's do it and do it quick.

If every shop in Iowa started one apprentice now, we will make 400 sheet metal workers in three to four years. But, as there will be more work to do in four years we will need still more men so we must keep this work up every year. **Don't** be afraid of flooding the market with these skilled men for as their number increases the industry will expand and more skilled sheet metal workers will be required.

Considering all of its branches, the sheet metal industry is one of the largest in this country today and it is one of the best in the country. I am proud that I am a small part of one of the biggest and best industries in this country and I am going to do everything I can to make it still bigger and still better. Are you? Think it over Brother Tink.

Terre Haute Committees for Indiana Sheet Metal Contractors' 1923 Convention.

The following committees have been appointed for the annual convention of the Indiana Sheet Metal Contractors' Association by the Terre Haute Local:

Program—S. L. Fenner, John Manion, George Pentecost and Karl Roth.

Reception—All members of the Terre Haute Local.

Badges and Registration—Leslie Beach, Secretary of the State Association, and E. W. Jones, Secretary of the Terre Haute Local.

Advertising—August Hartmann, Albert Hartmann and James F. O'Connell.

Hall, Hotel and Banquet—A. W. Dudley and Karl Roth.

Entertainment — John Manion, Thomas F. O'Herron and S. F. Bridwell.

Ladies' Entertainment — J. F. Hocker, H. Richmond and George Pentecost.

Indianapolis Campaigns Against Wooden Shingles.

The city fire protection movement inaugurated by Indianapolis, Indiana, includes a campaign against the use of wooden shingle roofs.

Wooden shingle roofs in Indianapolis have been the chief source of fires for several years past, more than sixty alarms being turned in during a single day on several occasions.

The great conflagration hazard involved is now clearly recognized and every effort will be made to get proper legislation to eliminate the shingle roof.

An ordinance is proposed which would make it obligatory on property owners to replace all shingle roofs with fire resistive material within seven years.

A meeting of representatives of firms selling such roofing was held in the Chamber of Commerce not long ago, and exhibits of roofing material are being shown all over the city, together with facts regarding the relatively low cost of this safer form of roof covering.

"If the present rate of roof fires keeps up," Chief Reidel of the local fire prevention bureau said, "the taxpayers will have to pay $500,000 soon for new fire fighting equipment. It costs the city approximately $50 each time a call is answered. During one month last year it cost the city about $27,500 just to put out roof fires."

He says if the roofs are not resurfaced the cost of new equipment will be greater than would be the cost of new roofs.

It would seem that here was a fine opportunity for the sheet metal contractors of Indianapolis to put in some hard work to good effect.

Small Contractors Must Keep Permanent Records for Tax.

"Every taxpayer carrying on the business of producing, manufacturing, purchasing or selling any commodities or merchandise, except the business of growing and selling products of the soil, shall for the purpose of determining the amount of income under the Revenue Act of 1921, keep such permanent books of account or records, including inventories, as are necessary to establish the amount of gross income and deductions, credits and other information required by an income tax return. The taxpayer shall produce such books of account or records for the inspection of revenue officers duly authorized by law to inspect the same, at such time and in the manner provided by law."

Meaning of the term "Taxpayer." —An important question arising under the above ruling with reference to the meaning of the term "taxpayer." This term, according to Section 2 of the statute includes "any person, trust or estate subject to a tax imposed by this Act." The term "person" includes partnerships and corporations as well as individuals. Upon the meaning of the term "subject to a tax" in the definition of a "taxpayer" depends the an-

swer to the question of whether the requirement for the keeping of records applies to all individuals, partnerships, corporations, estates or trusts or whether it applies only to those having a net income in an amount sufficient to make them liable for the payment of a tax. This is particularly important with reference to individuals conducting a small business who have heretofore kept no accounts and rendered no returns on the assumption that their income was less than the amount of the personal exemption. It seems probable that T. D. 3408 is intended to apply to this class of persons as well as those with larger incomes who have not been keeping permanent records and books of account. While a partnership is not a "taxpayer," the individuals composing it are, and the requirement that they keep books of account and records necessarily affects the partnership also. The provision excepting farmers from the requirement of keeping books undoubtedly excuses a class of persons whose records are the least adequate for the purpose of determining net income.

It follows that the mere fact that a business is small and has little or no net income will not excuse the taxpayer from keeping permanent books of account and records.

British Industrialist Sees Copper Shortage.

Brass World is mildly annoyed by a statement attributed to Sir Edward M. Edgar, a British banker and industrialist, to the effect that soon there will not be enough copper to supply the world demand. By "soon," the magazine says, Sir Edward means within 20 to 50 years.

"It would seem as if the noble knight had had himself interviewed," remarks *Brass World* editorially, "and that he particularly wished to stress the agreement that had been made between the Russian Soviet and Leslie Urquhart, called the Russo-Asiatic Consolidated Co. Sir Edward thinks the world is running short of copper, lead and zinc, but the present sources of the largest supplies (United States) will be supplemented by these vast Russian stores of the metals and be ready to mend the situation.

"What we mine, Sir Edward says, will be less, much less than enough for our own needs in a matter of about 20 years, or, at any rate, 50 years. Our extravagant and luxurious living methods will make the metals under comment inadequate," and so following for a long interview.

The crux of the thought would seem to lie somewhere in the depths of the quotation following. Perhaps the reader can discover it for himself:

" 'That is where the Russo-Asiatic Co. and the agreement with the Soviet authorities comes in. If it is allowed to develop to the full extent of its capacity, it might easily be the greatest producer and purveyor of copper, lead and zinc to the world. It will free British industry from its servitude to these essential trans-Atlantic raw materials and it will secure for us a sufficient supply that will be felt in every department of British commerce and manufacture, and it will result in the coming period of leanness and scarcity being followed by long years of plenty that will more than re-establish us in our old prosperity.' "

Notes and Queries

American Blow Torch.

From Charles F. Scott, Memphis, Texas.

Kindly let me know who handles the American blow torch, made in Sweden.

Ans.—Henry W. Peabody and Company, 17 State Street, New York City.

"Cromwell" Stove.

From Reliable Stove Company, Division American Stove Company, Cleveland, Ohio.

Can you tell us who makes the "Cromwell" stove?

Ans.—The manufacturers of this stove are out of business, but you can secure complete repairs for it from The Northwestern Stove Repair Company, 20 West Lake Street, Chicago, Illinois.

Address of Best-Heet Oil Burner Company.

From H. W. Swope, Jerry City, Ohio.

Please furnish me with the address of the Best-Heet Oil Burner Company.

Ans.—508 West Van Buren Street, Chicago, Illinois.

"Wright and Ditson" Ice Skates.

From Clark Hardware Company, Windom, Minnesota.

Can you tell us who manufactures the Wright and Ditson ice skates?

Ans.—Wright and Ditson Victor Company, 615 South Wabash Avenue, Chicago, Illinois.

Wire Crimper.

From Peter Stauber, 653 18th Street, Milwaukee, Wisconsin.

I should like to know who makes a crimper for No. 10 wire.

Ans.—Smurr and Kamen Machine Company, 328 North Albany Avenue, Chicago, Illinois.

Noble Malleable Range.

From Charles Scharf, 215 First Street, North, Newton, Iowa.

Please tell me who makes the Noble Malleable Range, as I desire to secure repairs for it.

Ans.—Fox Furnace Company, Elyria, Ohio.

Address of Phoenix Stove Works.

From J. H. Bedford, Bridgeport, Illinois.

Kindly let me know where the Phoenix Stove Works are located.

Ans.—This is really Butler Brothers, Randolph Street Bridge, Chicago, Illinois, who sell their stove under this name.

Robertson Blow Pipe Elbows.

From Melzer Sheet Metal Works, 774 Bates Street, Appleton, Wisconsin.

Please advise us who makes the Robertson one-piece galvanized blow pipe elbows.

Ans.—Robertson Brothers Manufacturing Company, 5401 Western Avenue Boulevard, Chicago, Illinois.

Magic Trammel Points.

From E. L. Hyre, Saybrook, Illinois.

Kindly inform me who manufactures Magic Trammel Points.

Ans.—The Lufkin Rule Company, Saginaw, Michigan.

Remember always that a chip on the shoulder is too heavy a piece of baggage to carry with you in the business world.

Events and Progress of the Hardware Trade.

What the Retailers, Jobbers and Manufacturers Are Doing. Latest Selling Methods and Experiences of Successful Men.

House to House Canvas Sells More Paint Than Charlie Thought Would Be Possible.

C. F. Woodward, Carlinville, Illinois, former President of the National Retail Hardware Association, recently told how he secured paint business in his town. The method is one which can well be copied by every hardware man in the country to good advantage.

Early in the spring he employed a man to make a house-to-house canvass and make inquiries about the need of paints and varnishes in each house. This man took with him a supply of interesting information in the form of folders and color cards, and was prepared to give practical suggestions, make estimates as to costs, and generally make the subject of particular interest to the owner of the house.

Mr. Woodward stated that as a result of this careful and service giving canvass, his sales of paints were increased to such an extent that it was difficult to keep a supply of materials on hand to serve their customers and fill the orders thus secured.

Ever Hear of Store Publication Like This.

In the little town of New Bedford, Illinois, are to be found two merchants, who, for enterprise, will stack up anywhere. If you doubt it, think of what they did—started a newspaper with all the local news of the community crammed into it, and carrying advertisements of their merchandise, and circulated it free in their buying territory.

The two merchants are Arthur H. Booth, hardware, and C. H. Lathrop, groceries, and they are joint editors of The New Bedford Booster, published the fifteenth of each month. It is a four-paged newspaper of three-column width.

Sparkling with live, local items and bearing a number of well typed and capably drawn ads, the Booster made its first appearance in October. Here are samples of the items:

"Hans Nelson called in town last week and ordered his house respouted, and in this he showed good judgment, as this kind of material is advancing in price.

"Don't forget the temperance program at the Christian Church, Sunday, October 29th.

"Born to Mr. and Mrs. Lee Renner, October 9th, a bouncing baby girl.

"Albert Clausen is the proud owner of a new Ford."

And then a little satirical shot at the mail order houses:

"It is with considerable interest that the writer learned from a public speaker the other day that Sears, Ward and Company pay no taxes at all on their large holdings."

Each of the co-editors carries two display ads each number and several "readers." Like the name of the publication, there is a tone of "boost" throughout, and the editor-owners have unselfishly opened their columns to other merchants desiring to advertise, presumably on the theory that helping one helps all in the community.

Catalog Houses Ask Credit Information from Retailers.

It used to be a common occurrence with retail hardware merchants to receive a letter of inquiry asking about the financial status of some of their customers. These letters bore the earmarks of a commercial agency communication. Many a retailer has at different times furnished information in response to such requests, that has enabled some catalog house to sell the very goods found on the merchant's floor to one of his perfectly good customers.

We reproduce below a letter of very recent date. In this instance the name of the merchant's competitior, the mail order house, is found in letters bold at the head of the sheet. What would you have done with this letter if you had received it? You don't need to say it out aloud unless you want to.

"SEARS, ROEBUCK AND CO.

Farmers Hardware Company,
Dec. 1, 1922
Shawano, 160 JJH/905
Wisconsin. T 12/11/22

Gentlemen:

The person named below wishes to open an account with us and has referred us to you for credit information.

We will appreciate it if you will furnish the information requested below and return this sheet to us, using the enclosed envelope.

This report is requested, and if furnished, will be used with the understanding that it is without liability on your part and with the assurance that it will be held strictly confidential.

SEARS, ROEBUCK & CO.

Re.....

1. How long have you known this person? ..... Business or Occupation.....
2. Is party steadily employed? .... By whom? .....
3. Approximate income ..... weekly.
4. Is party's reputation good? ..... Are bills paid promptly? .....
5. Do you consider party good for $93.00 payable $6.00 monthly? .....
6. Nationality or color ..... (This question is asked for statistical purposes)
7. About what age? It is important that we know if under 21 years ..... Married or single. .....
8. Does he own, rent or board? ..... Applicants family consists of .....
9. Other information ....."

Suggestions and Plans for Window Displays.

Instructive Examples from Exhibits in AMERICAN ARTISAN AND HARDWARE RECORD Window Display Competition.

"Show and Push" Campaign Sells This Merchant's Goods.

"Our experience in the retail business has been that a merchant and his sales force sell what they show and push."

This merchandising axiom comes from the David Mahoney Company of Schenectady, New York, dealers in hardware, paints, automobile and dairy supplies, and was prompted in an account furnished by them of a special window design by their Mr. M. C. Fisher, in charge of their housefurnishing department.

They reported that the window was one of the best they ever had, and that they were much pleased with the early season display, realizing fifteen immediate sales of ranges—about which the display was built—and receiving additional sales later in the season.

The floor was covered with a green wall paper containing a silk and light green tint, making a very beautiful covering for the floor for the occasion, and also an inexpensive one. For the background of the window there was placed a four-burner cooking stove, flanked on either side by a three-burner stove. In front of each was placed a single and double burner, and on these quite attractive cutouts furnsihed by the manufacturer.

Around the outer edge of the window were displayed electric irons. A pressure steam cooker was displayed in a prominent place in such a way as to show that it could be used with an oil stove as well as a gas or any other stove. On each stove was placed an oven and also a few aluminum cooking utensils to indicate that cooking and baking could be done at the same time.

The packages of flower and garden seeds, placed about the edge of the window, brightened up the whole picture on account of their brilliant and varied colors.

Successful Range Display Designed by M. C. Fisher for the David Mahoney Company of Schenectady, New York.

Have You Entered the Window Display Contest?

This being the annual Warm Air Heater Special of AMERICAN ARTISAN this inquiry is prompted:

How can a store window be utilized to display a furnace?

It can be done, for it has been done, and if the physical limitations of the window permit, such a display can be constructed to make an effective showing.

And take this tip: such a window would make a good entry in the annual window designing contest of AMERICAN ARTISAN AND HARDWARE RECORD, which is now on and will continue until April 1, 1923. In giving this tip, we are not endeavoring to display any occult ability to read the minds of the Board of Award in advance of their decision, and certainly not before the volume of entries have been received.

But it occurs to us that a window display designed to sell a furnace and parts and create demand for repairs would be certain to receive attention because of the inherent difficulties involved.

Of course, there will be many types of window displays entered in the contest, for the rules provide that the display may be made from any of the following lines: General hardware, machinists' supplies, builders' hardware, automobile supplies, sporting goods, fishing tackle, house furnishings and paints, cutlery, dairy supplies, stoves, ranges,

warm air heaters, sheet metal and kindred lines.

Photograph the window and then send the photograph, together with description of how the window display was arranged and the materials used by mail or express, charges prepaid, so it will reach this office *not later than April* 1, 1923.

Each photograph and description must be signed by a fictitious name or device and the same name or device must be placed within a sealed envelope containing the real name and address of the contestant, this sealed envelope to be enclosed with the photograph.

AMERICAN ARTISAN AND HARDWARE RECORD reserves the right to publish all photographs and descriptions submitted in the contest.

Four prizes, totaling $100, are to be awarded for the entries adjudged the most meritorious. These are: first prize, $50; second prize, $25; third prize, $15, and fourth prize, $10.

Flays Use of Cheaper Metals for Copper.

The following paper by George C. St. John, Vice-President of the U. T. Hungerford Brass & Copper Co., on "Substitution, the Fraud of the Day," appeared in the *Bulletin* of the Copper and Brass Research Association recently:

"Substitution the fraud of the day"—an expression coined years ago—is seldom heard now, probably because pure food laws and educational campaigns have somewhat minimized this evil.

There is still, however, imperative need of it, or some equally forceful slogan, in order to focus public attention on the fact that many articles in everyday use (such as locks, bolts, door knobs, padlocks, screw eyes, letter boxes, etc.) sold as solid brass all too frequently prove to be merely iron or steel, plated or dipped with brass. This is an evil that has assumed large proportions, and drastic corrective measures are urgently needed.

In the absence of legislation which should and doubtless will be enacted to stamp out this practice as just as great a fraud as offering counterfeit Sterling silver, the remedy lies in the force of education and public opinion.

It is but fair to say that the average hardware store has absolutely no thought of deception, but is probably the victim of a custom born of war-time necessity when copper and its alloys were conserved by government control and which forced the use of iron and steel in a field which they were not intended to cover permanently.

Undoubtedly if the subject is properly presented, dealers will be quick to lend their influence in favor of straight-forward dealing and will frankly tell the buyer exactly what he is getting. Salesmen who have not been properly instructed are partly responsible for an incorrect impression in the purchaser's mind, probably because they do not themselves understand the difference between solid brass and iron or steel which is plated or dipped to resemble brass or copper.

Buyers, if they want solid brass, should specifically demand it, and make it clear that unless brass is supplied, the article will be returned and a claim made for credit even though months may elapse before deterioration is apparent. They should also insist that invoices or cash sale slips specify exactly what is being sold,—that is, solid brass, brass plated, or dipped brass, otherwise it would be difficult to obtain a refund or other redress.

Each metal has its own field. Iron and steel are the very bulwarks of engineering and building development and no non-ferrous proponent would attempt to substitute brass and copper for bridge girders or rails! Conversely, an iron and steel man would not argue against the use of copper and brass for the purposes mentioned in this article.

Copper and brass are now being sold at prices which are about those of a twenty-year pre-war average. There is accordingly no valid reason for substitution, as the difference between the cost of producing the average household hardware article, such as door knobs, letter boxes, bolts and chains, etc., is represented only by the value of the metal itself, manufacturing and installation costs being substantially the same.

Bit of Humor May Help in Collecting Past Due Accounts.

A little humor is relished by all of us and humor with a point is more effective than harshness. The trouble with too many collection letters is that the personal feelings of the proprietor, who realizes he is not being treated right by customers that he trusted, creep into the letters. Often they aggravate the debtor's mind, for he feels almost as bad over not being able to pay, as you do in not getting the money. That is why you do not always get the money when he is able to pay. So try a little of the human interest-touching method. How would you, yourself respond to such a collection letter as this:

"Dear Mr. ———

I know why you haven't paid me for that hardware you bought four (or any other time) months ago. You were afraid I'd squander the money on the 'Andy Gump Congressional Campaign.'

That's all over now and you can 'Come Across' with that little amount of .....

Yours truly."

Why Not the Self-Serve Idea in Hardware?

The Self-Serve Idea in many stores has made rapid headway in the chain stores in the land; why cannot the aggressive hardware man so arrange his stock that customers can practically wait on themselves, asks a writer in an Eastern publication.

When a customer enters your store he is more than half sold, because the mere fact of his coming to your store shows his willingness to look over your stock, and perhaps purchase. Why not make things easier for him to select by presenting them in an attractive manner, plainly priced, department-

ized if you wish. It does not take long for news of this character to spread in the surrounding territory.

Long Store Hours Do Not Increase Sales.

"I am of the opinion," said a successful retail merchant, "that a man can do more work in sixty hours per week than in eighty and be in better physical and mental condition for the work. Lounging breaks discipline and kills any enthusiasm in sales. Keep in mind that it is not a question of how large your sales are, but what profits you make. You must have a goodly showing of profit bearing goods in your store and keep the sales end of your business from degenerating."

Coming Conventions

Western Implement and Hardware Association, Kansas City, Missouri, January 16, 17, 18 and 19, 1923. Exhibition in Convention Hall. H. J. Hodge, Secretary, Abilene, Kansas.

Texas Hardware and Implement Association, Dallas, Texas, January 23, 24 and 25, 1923. A. M. Cox, Secretary, 822 Dallas County Bank Building, Dallas, Texas.

Mountain States Hardware and Implement Association, Denver, Colorado, January 23, 24 and 25, 1923. W. W. McCallister, Secretary-Treasurer, Boulder, Colorado.

Kentucky Hardware and Implement Association and Exhibition, Jefferson County Armory, Louisville, Kentucky, January 23, 24, 25 and 26, 1923. J. M. Stone, Secretary, Sturgis, Kentucky.

West Virginia Hardware Association Convention and Exhibition, Huntington, West Virginia, January 30 and 31, and February 1, 1923. James B. Carson, Secretary, 1001 Schwind Building, Dayton, Ohio.

South Dakota Retail Hardware Association, Sioux Falls, South Dakota, January 16, 17, 18 and 19, 1923. H. O. Roberts, Secretary, 1120 Metropolitan Life Building, Minneapolis, Minnesota.

Idaho Retail Hardware and Implement Dealers' Association, Boise, Idaho, January 31, February 1 and 2, 1923. E. E. Lucas, Secretary, Hutton Building, Spokane, Washington.

Indiana Retail Hardware Association Convention and Exhibition, Indianapolis, Indiana, January 30 and February 1 and 2, 1923. G. F. Sheely, Secretary, Argos, Indiana.

Oklahoma Hardware and Implement Association, The Auditorium, Oklahoma City, Oklahoma, January 31, February 1, 1923. W. A. Clark, Secretary-Treasurer, 209½ West Main Street, Oklahoma City, Oklahoma.

Nebraska Retail Hardware Association, Convention and Exhibition, February 6 to 9, 1923, Omaha, George H. Dietz, Secretary-Treasurer, 414 Little Building, Lincoln, Nebraska.

Michigan Retail Hardware Convention, Windsor Hotel, Jacksonville, Florruary 6, 7, 8, 9, 1923. Karl S. Judson, Exhibit Manager, 248 Morris Avenue, Grand Rapids. A. J. Scott, Secretary, Marine City, Michigan.

Virginia Retail Hardware Association, Norfolk, Virginia, February 7, 8 and 9, 1923. Thomas B. Howell, Secretary, Richmond, Virginia.

Wisconsin Retail Hardware Association, Milwaukee Auditorium, Milwaukee, Wisconsin, February 7, 8 and 9, 1923. P. J. Jacobs, Secretary, Stevens Point, Wisconsin. George W. Kornley, Manager of Exhibits, 1476 Green Bay Avenue, Milwaukee, Wisconsin.

Pennsylvania and Atlantic Seaboard Hardware Association Convention and Exhibition, Philadelphia Commercial Museum, Philadelphia, Pennsylvania, February 12, 13, 14, 15 and 16, 1923. Sharon E. Jones, Secretary, 1314 Fulton Building, Pittsburgh, Pennsylvania.

Ohio Hardware Association Convention and Exhibition, Cleveland, Ohio, February 13, 14, 15 and 16, 1923. Exhibition in the new Municipal Hall. James B. Carson, Secretary, 1001 Schwind Building, Dayton, Ohio.

Illinois Retail Hardware Association Convention and Exhibition, Hotel Sherman, Chicago, Illinois, February 13, 14 and 15, 1923. L. D. Nish, Secretary-Treasurer, Elgin, Illinois.

Iowa Retail Hardware Association Convention and Exhibition, Des Moines, Iowa, February 13, 14, 15 and 16, 1923. A. R. Sale, Secretary, Mason City, Iowa.

North Dakota Retail Hardware Association, Grand Forks, North Dakota, February 14, 15 and 16, 1923. C. N. Barnes, Secretary, Grand Forks, North Dakota.

Missouri Retail Hardware Association Convention and Exhibition, Planters Hotel, St. Louis, Missouri, February 20, 21 and 22, 1923. F. X. Becherer, Secretary, 5106 North Broadway, St. Louis, Missouri.

Minnesota Retail Hardware Association, Duluth, Minnesota, February 20, 21, 22 and 23, 1923. H. O. Roberts, Secretary, 1120 Metropolitan Life Building, Minneapolis, Minnesota.

New England Hardware Dealers' Association Convention and Exhibition, Mechanics' Building, Boston, Massachusetts, February 21, 22 and 23, 1923 George A. Fiel, Secretary, 10 High Street, Boston, Massachusetts.

New York State Retail Hardware Association Convention and Exposition, Rochester, New York, February 20, 21, 22 and 23, 1923. Headquarters, Powers Hotel. Sessions and Exposition at Exposition Park. John B. Foley, Secretary, City Bank Building, Syracuse, New York.

Indiana Sheet Metal Contractors' Association, Terre Haute, Indiana, February 21 and 22, 1923. Leslie Beach, Secretary, Richmond, Indiana.

Michigan Sheet Metal and Roofing Contractors' Association, Bay City, February 26, 27, 28 and March 1, 1923. Frank E. Ederle, Secretary. 1121 Franklin Street, S. E., Grand Rapids, Michigan.

Iowa Sheet Metal Contractors' Association, Sioux City, Iowa, March 14, 15, 1923. R. E. Pauley, Secretary, Mason City, Iowa.

American Hardware Manufacturers' Association, Spring Convention, Windsor Hotel, Jacksonville, Florida, April 24, 25, 26 and 27, 1923. Frederick D. Mitchell, Secretary - Treasurer, 1819 Broadway, New York City.

Southern Hardware Jobbers' Association and Exhibition, Grand Rapids, Febida, April 24, 25, 26 and 27, 1922. John Donnan, Secretary-Treasurer, Richmond, Virginia.

Old Guard Southern Hardware Salesmen's Association, Windsor Hotel, Jacksonville, Florida, April 25, 1923. R. P. Boyd, Secretary-Treasurer, R. F. D. 4, Knoxville, Tennessee.

Hardware Association of the Carolinas, Columbia, South Carolina, May 8, 9, 10 and 11, 1923. T. W. Dixon, Secretary-Treasurer, Charlotte, North Carolina.

Arkansas Retail Hardware Association, May, 1923. (Place to be announced later.) L. P. Biggs, Secretary, 815-816 Southern Trust Building, Little Rock, Arkansas.

National Retail Hardware Association, Richmond, Virginia, June, 1923. Herbert P. Sheets, Secretary-Treasurer, Argos, Indiana.

Southeastern Retail Hardware and Implement Association, covering Tennessee, Alabama, Georgia and Florida. (Date and place to be announced later.) Walter Harlan, Secretary-Treasurer, 701 Grand Theater Building, Atlanta, Georgia.

Retail Hardware Doings

Iowa.

P. M. Mead has purchased the McCoy Hardware store at Brighton.

Verne Whitnell expects to open a hardware store at Scranton.

Michigan.

The Kutzen Hardware store has opened for business at 8227 Harper Avenue, Detroit.

The Burke Hardware Company at Pontiac has been destroyed by fire.

Minnesota.

At Hamburg, August Mielke has purchased the hardware store of Mr. Deier.

Fay J. Williams has opened a hardware store at Viola.

Nebraska.

C. O. Hurd has purchased a hardware store at Benson.

B. B. Barber has purchased the interest of his partner in the Barber and Henders Hardware business at Homer.

J. M. Strahan has purchased a hardware store at Madison.

O. A. Rystrom and R. A. Freeman have purchased a hardware and implement store at Murray.

At Wahoo, F. A. Votruba has sold his hardware store to Peter Vavak.

North Dakota.

J. S. Lombard has sold his hardware store at Sanish to August Myers and A. T. Olson.

South Dakota.

S. O. Lewis has sold his hardware store to Will Carroll.

The firm of Overholser-Leach have sold their Glenham hardware store to Beckman Brothers.

Wisconsin.

W. E. Bender has sold his hardware business at Viola to Charles Kinder.

At Valmy, Fred Suchy has taken over the hardware business of Charles Nieman.

The Latest News About Stoves and Ranges

Items and Discussions of Interest to the Manufacturer and Retailer of Kitchen Ranges, Heating Stoves and Accessories.

Stove Molders Gained Wage Advance and Other Advantages.

At the conference which was recently held in Atlantic City, New Jersey, between committees of the International Molders' Union of North America and the Stove Founders' National Defense Association, the following advances in wages were gained by the molders:

Piece prices advanced 16 2/10 per cent.

Minimum day rate was set at $6.50.

Day molders were advanced 50 cents a day.

Several changes in the general agreement covering working conditions, all favoring the Molders, were also made.

As there is little likelihood of greater volume of work per day by each individual worker, and less of lower price on raw materials used by stove manufacturers, it seems only too fair to assume that, at best, there will be no reduction in prices on stoves and ranges in 1923.

Merchant Caters to Women Buyers to Sell Stoves.

"I've been in this neighborhood only a year or so," a hardware dealer told me not long ago, "but I have developed as good a stove business as any dealer could want. I give credit to the fact that from the very start I have tried to interest the women in my store.

"Women are the real stove buyers, nowadays. If you interest the mistress of the house in your make of range or heater, ten to one that is the make that will ultimately be bought.

"More than that, the initiative for most stove sales comes from the women folk. They are the ones who agitate—yes, nag and clamor—until the man of the house gets tired and goes stove-hunting. So you have to appeal to the woman to get things started, and to interest the woman in order to close the sale."

This dealer's experience as told in the *Michigan Tradesman,* and methods are neither startling nor revolutionary; but they are for that reason all the more illuminating.

A little over a year ago he bought a business in a residential section. The store was fairly well established; and the new owner set himself aggressively to the task of interesting the ladies.

His first step was to renovate and brighten the store. In the first two months of his occupancy, he made some very sweeping changes. Old counters were removed and replaced by silent salesmen, the ceiling was cleared of goods and given a fresh coat of paint, and the whole aspect of the place made different. From a dingy, uninviting hole it was transformed into a bright and cheery store with an attractively arranged showing of goods.

The next step was to get in a stock of goods that would appeal especially to the women. The merchant studied catalogs and trade papers in search of information about new goods; and every novelty that had practical value was given a trial. The latest articles in the way of household conveniences and lavor-saving devices were stocked. Every time a woman customer entered the store, in those first few months, it seemed that the merchant had something new to show her. It might be a combination sauce pan and strainer, a kettle with the lid at the side or some such innovation. As the neighborhood was a well-to-do one, many of the housewives could afford to purchase these innovations; and the result was a pretty steady sale of these articles.

The sales thus made were, however, a minor matter, from the dealer's standpoint. The great benefit, as he saw it, lay in the fact that the women got into the habit of dealing at his store regularly.

The first fall he was in business the merchant began to reap the larger benefits of his campaign. Having secured the interest of the women folk, he was in a position to introduce his stove proposition to a large number of them.

He arranged a demonstration and sent out personal invitations to every woman in his territory to attend. The back of the store was arranged for the purposes of the demonstrations, with plenty of chairs placed in a semicircle around the range to be featured. On three afternoons there was a large attendance; and the demonstrations resolved themselves into pleasant, chatty little affairs. Some wives brought their husbands; but the men, all through, were conspicuous by their absence.

The proprietor of the store watched the development of the campaign through the succeeding three weeks; and was able to compile some figures fairly bearing out his contention that the women were the dominant factor in the stove trade.

"I sold nine ranges," he said, "which the men of the house never even saw. The women conducted the negotiations all through. I offered in one case to send the range up to the house to let the husband see it, but the wife vetoed the suggestion as quite unnecessary.

In about a dozen other cases the husbands were brought down to see the ranges purely as a matter of form. I could see that the sale in each case had been made before the men entered the store; and for that matter, they appeared quite willing to acquiesce in anything their wives said."

Bad taste is just bad education.

How Wendel's Hardware Sells Ranges.

For simplicity and for the straightforward, compelling force that goes with simplicity, the ad of the Wendel's Hardware of Onekama, Michigan, and published in the Bear Lake, Michigan, *Beacon,* as reproduced here, stands as a model.

In large, bold type, the ad leads off with the name of the single product to which the ad addresses itself. Then this message:

"This beautiful gray and white enamel solid cast iron range is built to stand a lifetime of wear and is so constructed that it will bake and cook with the least possible fuel consumption. Has aerated oven, concealed pipe, solid copper reservoir and many other features."

And then the price — plainly marked.

The cut adds the final touch.

GARLAND
GARLAND STOVES AND FURNACES
The World's Best
RANGE
This Beautiful Gray and White Enamel Solid Cast Iron Range is built to stand a life time of wear and is so constructed that it will bake and cook with the least possible fuel consumption.
Has aireated oven, concealed smoke pipe, solid copper reservoir and many other features
$135.00
WENDEL'S HARDWARE
ONEKAMA, MICHIGAN
QUALITY SERVICE SATISFACTION

The Corner Has Turned with the Farmer.

"A year ago I expressed the belief that the worst was over," the Secretary of Agriculture declares. "I think the events of the year have justified that forecast."

Bearing out this view that the worst is past, Wallaces' Farmer has drawn up a careful balance sheet for the average corn and oats grower of Iowa in recent years, says a New York publication. From all the data of production costs and market returns available it finds that the typical tenant who pays half his produce in rent and grows the average crop had a profit of 11 cents a bushel on corn in the last year before the world war; 38 cents in 1917; 24 cents in 1918; 26 cents in 1919; a loss of 44 cents in 1920; a loss of 33 cents in 1921; and a profit of 5 cents in 1922.

In growing corn the same typical renter had 6 cents profit in 1913; 17 cents in 1916; 30 cents in 1917; 15 cents in 1918; 1 cent in 1919; a loss of 22 cents in 1920; a loss of 35 cents in 1921, and an even break in 1922. Such farmers are just turning the corner.

With the improvement in the price of their products, wheat at $1.20 in Chicago, corn above 70 cents and oats at 45 cents, the farmers' market is more favorable than any time since 1919. Also his costs of production have been decreased. Low feed prices have brought horse labor to pre-war rate, and farm wages have declined to one and one-third the pre-war level.

Can You Measure Purchasing Power of Your Community?

How to define and measure the buying power of a community is a problem that has been receiving much attention from business statisticians. With the purpose of developing methods and material which can be employed for measuring this purchasing power more accurately than has hitherto been possible, the J. Walter Thompson Company of New York City has offered three prizes of $1,500, $800 and $500 for the best work on a "statistical index of the purchasing power of consumers in the United States." The contest is open to all who wish to participate, and the papers must be submitted by September 30, 1923. It is the desire of the donor that the work be limited to buying power of the ultimate consumer, and it is suggested that more satisfactory results may be obtained if the study is limited to some definite and well defined area rather than the entire country.

Can you continue to do as you are doing and retain your self-respect, or have you habits and customs you know are detrimental to your character?

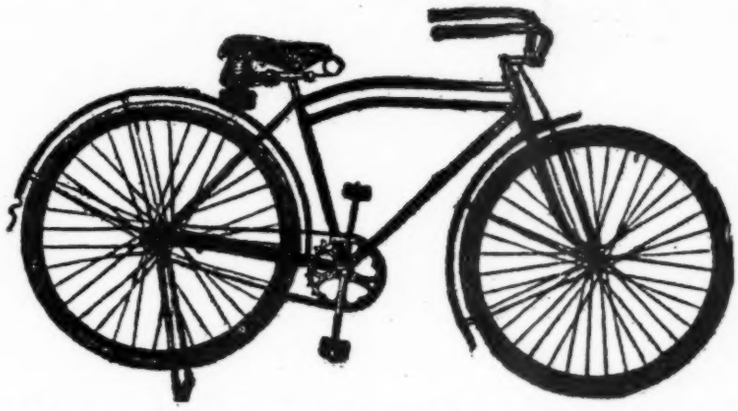
Study and Interpretation of Advertisements.

You Can Make Your Advertisements More Gainful by Avoiding the Faults and Profiting by the Good Qualities of Others.

Here is an ad calculated to ease Dad's troubles.

The Sprague Hardware Company of Kalamazoo, Michigan, announces in the *Gazette* of that city that "We've Made It Possible for Every Boy to Own a Bicycle," and then also be made profitable, is bicycle riding.

"With a good bicycle, a boy can derive healthful exercise on rides in the country or on fishing trips to the lake, or he can make money by running errands.



We've Made It Possible for Every Boy To Own a Bicycle

One of the most beneficial exercises, one of the greatest pleasure-giving pastimes for boys, which can also be made profitable, is bicycle riding.
With a good bicycle, a boy can derive healthful exercise on rides in the country or on fishing trips to the lake, or he can make money by running errands.
We have inaugurated an easy payment plan by which a boy can make use of one of our good bicycles while paying for it. Ask us about this plan.

Sprague Hardware

308 West Main St.

in unfolds a proposition that the boy himself can earn and pay for it. Under the foregoing caption appears this appeal:

"One of the most beneficial exercises, one of the greatest pleasure-giving pastimes for boys, which can

"We have inaugurated an easy payment plan by which a boy can make use of one of our good bicycles while paying for it. Ask us about this plan."

This ad has a simple, direct appeal, and the installment plan of payment offers interesting and no doubt profitable possibilities. The ad is well typed and enhanced by a cut of a bicycle. It could have been aptly "followed up" by other ads, stressing the good points of the bicycle makes offered, and also prices.

* * *

Curiosity is apt to lead many customers to investigate the merits which the Joseph Hardware Store, of Marion, Ohio, claims for

THE
"Ray Glo"

Will more than pay for itself in one season. It makes quick, clean, odorless heat immediately, and will operate on the lowest possible pressure of gas.

THE
JOSEPH
Hardware Store

"RayGlo" in the accompanying four-inch advertisement. The Joseph Hardware Store makes it plain that the RayGlo is a heating device, that it operates quickly, and that it uses a small amount of gas. All these are statements calculated to make buyers investigate. The additional declaration that the device will "pay for itself in one season" is a strong point.

* * *

"If you have an idea," said the veteran copy writer, "don't quit by announcing it. Follow it through until everyone understands it as well as you do."

Review of Conditions in the Metal Markets.

General Situation in the Steel Industry. Report of Prices and Tendencies in Sheet Metals, Pig Iron, etc.

Tin, Lead and Copper Reach New High Levels.

The holiday week was made significant by the arrival at new high peaks, not attained in two years, of tin, lead and copper, and there were indications that the non-ferrous metals would continue to show strength. Copper was firm at 14.62½ to 14.75 cents for electrolytic, spot and nearby. Tin was steady with spot and futures at 39 cents. Lead was steady at 7.25 to 7.35 cents. The zinc market was quiet at 7 to 7.10 cents, although St. Louis zinc slabs were higher at 7.15 cents.

Copper.

A heavy tonnage of copper has been taken by consumers for first quarter and first half delivery. It is estimated that December copper sales have exceeded 200,000,000 pounds, making it the best month of the year. Orders taken by the mills for fabricated products have been exceptionally heavy and the buying has been mostly covering against these orders.

Electrolytic copper has advanced about ⅞ cent since December 1. Wire quotations have advanced ¾ to 1 cent; copper products ¾ cent; and brass products ½ cent or more. Copper scrap prices have advanced ½ cent. The producers' price for lake has advanced to 14.75 cents to 14.87½ cents, delivered; casting copper has been in heavy demand at 14.25 cents, refinery.

Sales for December, it is estimated will bulk larger than for any previous month this year, possibly exceeding 200,000,000 pounds. The previous record was made in May when sales were just short of this total.

Zinc.

The zinc market today is nominal at 7.00 cents East St. Louis basis for December, 6.95 cents to 7.00 cents for January, but no trading is heard of.

The independent sheet mills are naturally complaining over the unprofitableness of the price of galvanized sheets with zinc at around 7.00 cents, and in some instances it is likely that operations in this line will be curtailed or temporarily abandoned. The outlook in this direction is uncertain, and must affect the demand for zinc for the next quarter.

This unfavorable feature may be offset to some extent by the better condition of the brass trade, but the full effect of this is not likely to be felt in the early part of the year.

Export shipments have been going forward at a high rate and are expected to affect materially the December statistical position. High grade zinc has been selling at 8 cents to 8.25 cents, delivered.

Lead.

Following the advance in lead prices by the smelting company to 7.25 cents, New York, 7.05 cents East St. Louis, the outside market which previously had been reactionary, strengthened. Consumption proceeds heavily and there is very little lead offering in the outside market and while the producers have a small tonnage to spare for regular trade, their position both for prompt and January is decidedly close.

Despite the greater production in 1922, there will be much less lead carried over this year than last. At the opening of 1922 some prominent producing interests had considerable reserves of high cost lead still on hand carried from the time of the drop in prices in 1920.

These were nearly all liquidated in the first half of the year, at which time the prolonged extent of the upward movement was hardly looked upon as having been reached.

Solder.

Chicago warehouses quoted solder prices as follows: Warranted, 50-50, per 100 pounds, $25.50; commercial, 45-55, per 100 pounds, $24.00; and Plumbers', per 100 pounds, $22.75.

Tin.

Foreign speculation continues to rule the tin market.

Business in tin has been largely a matter of speculating in exchange, due to the erratic movement of the exchanges lately. However, London prices have been likewise strong in a continued puzzling market and Straits tin has sold at its high level for the past two years, 39 cents. Lower grades of tin are at a big discount.

Bolts and Nuts.

Contracting for first quarter bolts and nuts continues to be done, although slowly in the Chicago district, no inducement being shown. Just why this market is slow is not apparent. In addition to the contracts for future delivery some spot business is coming out and makers are fairly busy.

Jobbers as well as large consumers of nuts, bolts and rivets in the Pittsburgh territory have been closing up their first quarter 1923 needs on the basis of fourth quarter 1922 prices with leading producers here. In most cases several carloads of 500 tons or more at a time are involved. Against these, specifications shortly will be issued at the rate of a carload or two a month, some of the larger ones requiring up to five carloads monthly.

Once in awhile a 1,000-ton lot is noted but these are rare. Operations continue on the basis of 70 or 75 per cent of capacity and the quoted prices are unchanged.

Nails and Wire.

With a good volume of business, the Chicago market for wire and

Copper is coming back—

ANACONDA Economy Strip Copper makes possible the increased use of copper for general roofing purposes and for gutters, leaders and conductor pipes by eliminating most of the waste and labor expense incurred when regular copper sheets are trimmed and prepared for shaping.

Straight and flat as a board, Anaconda Economy Strip Copper is produced with edges absolutely parallel and with the right temper. It need only be shaped in the usual way. It is supplied in flat lengths of 6, 8 or 10 feet, in widths of 6 to 18 inches and in weights of either 14 or 16 ounces. It can be delivered promptly from any of the mills of the American Brass Company listed below.

If your jobber does not handle Anaconda Economy Strip Copper, correspond with the nearest office.

THE AMERICAN BRASS COMPANY

GENERAL OFFICES, WATERBURY, CONN.

MILLS AND FACTORIES

Ansonia, Conn. Torrington, Conn. Waterbury, Conn. Buffalo, N.Y. Kenosha, Wis.

OFFICES AND AGENCIES

New York Philadelphia Boston Providence Pittsburgh
Cleveland Cincinnati Detroit Chicago St. Louis San Francisco

ANACONDA AMERICAN BRASS LIMITED, NEW TORONTO, ONTARIO, CANADA

ANACONDA
STRIP COPPER

nails promises to carry over into the new year without a break. New business is coming in at least equal to production and in some lines in excess of shipments. Operation by a mill in Indiana has not yet increased deliveries, but by January 1 is expected to relieve the situation somewhat. Raw material is reaching wire mills in better supply.

Demand for barbed wire is expected to start soon and this will add to the tonnage needed. Prices are unchanged at 2.45 cents for wire and 2.70 cents, Pittsburgh, for nails.

Most Pittsburgh makers of wire products are heavily committed for several weeks to come, particularly on nails. One large producer is 12 to 15 weeks behind on nail deliveries and several independents have orders for almost as many as they can produce in the first quarter. On certain sizes they still can promise deliveries in March.

Orders for woven wire fencing latterly have improved in volume. Jobbers have had indicated to them that buying in the spring will be extensive and hence they are now ordering in their stocks.

Tin Plate.

Tin plate users requiring plate for packers' cans are increasing first quarter bookings. One case is noted the past week where several hundred thousand base boxes have been contracted for at stated amounts per month over the first quarter and on Saturday 100,000 base boxes or 5,000 tons were added for March shipment.

Tin plate producers are confident with regard to prospects for the first half and look for increased production from month to month. At present, independents are averaging 85 per cent while the American Sheet & Tin Plate Company was able to increase to a 75 per cent basis last week on account of improved car and steel supplies. The market price is unchanged at $4.75 per base box of 100 pounds, Pittsburgh.

Finding Chicago mills unable to take on further steel sheets, buyers are placing their business with Pittsburgh and valley mills, the latter still being able to assume further obligations for first quarter. Mills in the East have been accumulating a fair tonnage from western users and additional business is coming out constantly.

Regular prices are being named for this business, 2.50 cents for blue annealed, 3.35 cents for black and 4.35 cents for galvanized, all Pittsburgh base. These are the same as have been applied on business booked by Chicago mills.

Iron and Steel Industry in West Closes Year of Satisfactory Business, Improvement Ahead.

First Six Months Period of Lagging, Then Orders Commenced—Bookings Heavy for Future.

THE year 1922 will go down into history as a satisfactory one in the steel industry in the west. Although business was far from good the first part of the year the last six months showed a decided improvement in demand from practically all sources, including many industries which had been out of the market for a more or less extent for several years.

During the first half of the year steel producers in the Chicago district operated at 50 per cent of capacity and less but toward the end of the year the output was boosted to 75 per cent or 80 per cent. During the first half of the year practically all producers of steel could not pay dividends except to take them from surplus but during the last half of the year prices were more satisfactory and mills were being hard pressed for deliveries.

Prospects for 1923 are exceptionally bright according to leading members of the trade here. Bookings are heavy, and prices are far more satisfactory. Although railroads have placed large car orders for cars the buying movement was not started until late in the year and they are expected to place a large number more. Some important steel men say the carriers have just commenced to buy cars and that they will place large numbers during the first part of 1923.

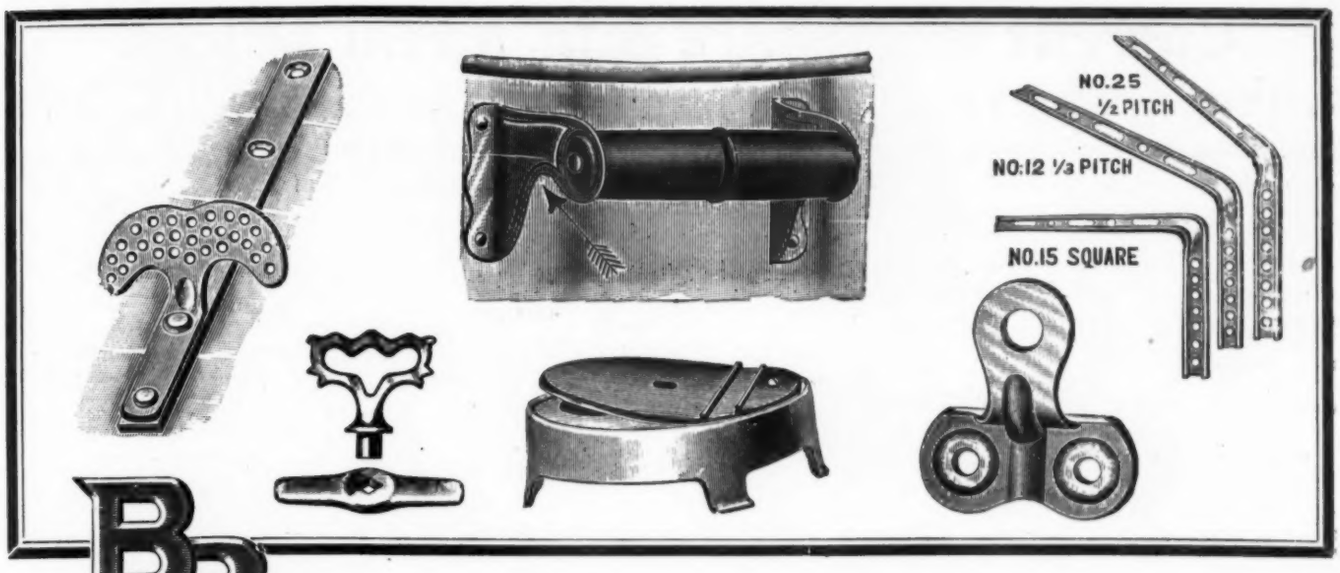
The Crane Company of Chicago, which has extensive business both in the United States and Canada, issued an interesting summary of conditions in part as follows:

Northern zone—General business is fair and collections rather slow. Volume of building permits is rather small, with few strikes, a fair supply of labor, and little unemployment. Banking conditions are fair, but improving. The stocks and marketing conditions are rather poor. General manufacturing conditions are fair and the retail trade in the large cities is good but not satisfactory in the outside towns. Railroad conditions are improving.

Central zone—This zone is in excellent condition as a whole. General business is good and collections satisfactory. There is no great shortage of labor, unemployment is small, and few strikes. Banking conditions seem to be extremely satisfactory. Manufacturers report business as fair to good and retail trade is heavy. Railroad conditions are fair and improving.

Western zone—The volume of business is satisfactory, with collections quite good. Building permits are large. Labor conditions are fairly satisfactory, with a few strikes and very little unemployment. In some localities there is a moderate shortage. Banking conditions are good. Crops and their distribution and general manufacturing are fair to good. Retail trade is generally good, while railroad conditions are not satisfactory but improving.

Buying of pig iron in the Chicago market resumed its briskness after the Christmas holidays. The price of Lake Superior charcoal iron has settled at $30 furnace.



Sheet Metals of all kinds

"ARMCO" and "TONCAN" SHEETS

Copper, Zinc and Lead Sheets

Metal Lath and Shingles

"PARKER" PRODUCTS

Skylights

Ventilators

Tinners' Machines and Tools

WARM AIR AND STOVE PIPE

Fire Pots

Roofing Supplies

NO DUST ever settles on the orders that reach us—"The House of Service."

The largest stocks of the most complete list of high grade supplies and specialties for the tinsmith are always available and on tap to be rushed to you.

We've been "Tinsmiths' Headquarters" for thousands of sheet metal contractors for many years and our highly trained organization and up-to-the second facilities are ready to add your name to their service schedule.

We are manufacturers as well as jobbers and if you can't get what you want from us it can't be had.

Our large illustrated catalog gives you an idea of how we can serve you—write for a copy today.

Order from this catalog
No. 9---It saves time

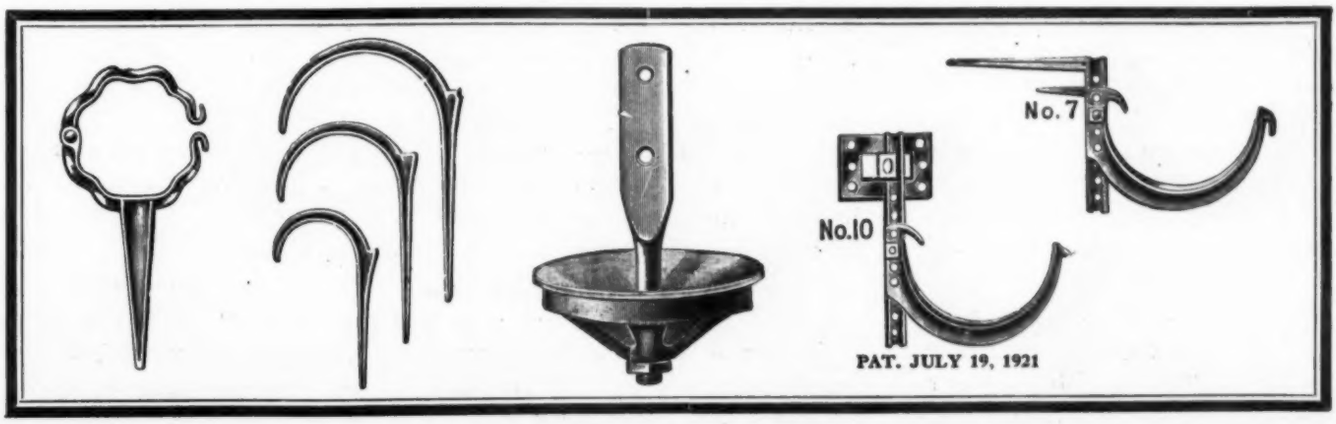
Send your next order to us—let our service and prices tell you why we are "Tinsmiths' Headquarters."

BERGER BROTHERS CO.

229-231-233-235-237 ARCH STREET

Warerooms and Factory: 100 to 114 Bread St.

PHILADELPHIA, PA.



Current Hardware and Metal Prices.

AMERICAN ARTISAN AND HARDWARE RECORD is the only publication containing Western Hardware and Metal prices corrected weekly.

METALS

PIG IRON.

Chicago Foundry	28 00 to 28 50
Southern Fdy. No. 2	29 01 to 30 01
Lake Sup. Charcoal	33 15
Malleable	28 00 to 28 50

FIRST QUALITY BRIGHT TIN PLATES.

			Per Box
IC	14x20	112 sheets	$10 00
IX	14x20		11 25
IXX	14x20		12 60
IXXX	14x20		13 90
IXXXX	14x20		15 25
IC	20x28		20 00
IX	20x28		22 50
IXX	20x28		25 20
IXXX	20x28		27 80
IXXXX	20x28		30 50

COKE PLATES.

Cokes, 180 lbs.	20x28	$11 80
Cokes, 200 lbs.	20x28	12 00
Cokes, 214 lbs. IC	20x28	12 25
Cokes, 270 lbs. IX	20x28	14 10

BLUE ANNEALED SHEETS.

Base ..... per 100 lbs. $4 00

ONE PASS COLD ROLLED BLACK.

No. 18-20	per 100 lbs.	$4 65
No. 22-24	per 100 lbs.	4 70
No. 26	per 100 lbs.	4 75
No. 27	per 100 lbs.	4 80
No. 28	per 100 lbs.	4 85
No. 29	per 100 lbs.	4 95

GALVANIZED.

No. 16	per 100 lbs.	$5 10
No. 18-20	per 100 lbs.	5 25
No. 22-24	per 100 lbs.	5 40
No. 26	per 100 lbs.	5 55
No. 27	per 100 lbs.	5 70
No. 28	per 100 lbs.	5 85
No. 30	per 100 lbs.	6 35

BAR SOLDER.

Warranted.
50-50 ..... per 100 lbs. $25 50

Commercial
45-55 ..... per 100 lbs. 24 00
Plumbers .... per 100 lbs. 22 75

ZINC.

In Slabs 8 60

SHEET ZINC.

Cask lots, stock 10¾c
Less than cask lots 11½c

COPPER.

Copper Sheets, base 21½c

LEAD.

American Pig ..... $ 7 50
Bar 8 25

Sheet.
Full coils .... per 100 lbs. 10 25
Cut coils ..... per 100 lbs. 10 50

TIN.

Pig Tin ..... per lb. 41c
Bar Tin 43½c

HARDWARE, SHEET METAL SUPPLIES, WARM AIR HEATER FITTINGS AND ACCESSORIES.

ADZES.

Coopers'.
Barton's ..... Net
White's ..... Net

AMMUNITION.

Shells, Loaded, Peters.
Loaded with Black Powder 18%
Loaded with Smokeless Powder 18%
Winchester.
Smokeless Repeater Grade ..... 20 & 4%
Smokeless Leader Grade ..... 20 & 4%
Black Powder ..... 20 & 4%
U. M. C.
Nitro Club ..... 20 & 4%
Arrow ..... 20 & 4%
New Club ..... 20 & 4%
Gun Wads—per 1000.
Winchester 7- 8 gauge 10&7½%
" 9-10 gauge 10&7½%
" 11-28 gauge 10&7½%

ASBESTOS.

Paper up to 1/16 ..... 6c per lb.
Rollboard ..... 6¼c per lb.
Millboard 3/32 to ⅛ ..... 6c per lb.
Corrugated Paper (250 sq. ft. to roll) .... $6.00 per roll

AUGERS.

Boring Machine ..... 40&10%
Carpenter's Nut 50%
Hollow.
Stearns No. 4, doz. $1150
Post Hole.
Iwan's Post Hole and Well 35%
Vaughan's, 4 to 9 in. $15 60

AWLS.

Brad.

No. 3 Handled	per doz.	$0 65
No. 1050 Handled	"	1 40
Patent asst'd, 1 to 4	"	35

Harness.

Common	per doz.	$1 05
Patent	"	1 00

Peg.

Shouldered	"	1 60
Patented	"	75

Scratch.
No. IS. Socket Handled ..... per doz. $2 50
No. 344 Goodell-Pratt, list less 35-40%
No. 7 Stanley ..... per doz. $2 25

AXES.

First Quality, Single Bitted (unhandled), 3 to 4 lb., per doz. $13 50
Good Quality, Single Bitted, same weight, per doz. 12 50

BALANCES, SPRING.

Universal.
Sight Spring ..... List less 25%
Straight ..... List less 25%

BARS, CROW.

Steel, 4 ft., 10 lb. ..... $ 80
Steel, 5 ft., 18 lb. 1 40
Pinch bars, 5½ ft., 24 lb. 1 60

BARS, WRECKING.

V. & B. No. 12 ..... $0 34
V. & B. No. 24 ..... 0 43
V. & B. No. 324 ..... 0 57
V. & B. No. 30 ..... 0 48
V. & B. No. 330 ..... 0 63

BEVEL, TEE.

Stanley's Rosewood handle, new list ..... Nets
Stanley iron handle ..... Nets

BINDING CLOTH.

Zinc 55%
Brass 40%
Brass, plated 60%

BITS.

All Vaughan and Bushnell.

Screw Driver, No. 30, each	$ 27
Screw Driver, No. 1, each	16
Reamer, No. 80, each	41
Reamer, No. 100, each	41
Countersink, No. 13, each	20
Countersink, Nos. 14-15 each	27

BLADES, SAW.

Wood.
Atkins 30-in.

Nos.	6	40	26
	$3 90	$9 45	$5 40

BLOCKS.

Wooden 45%
Patent 45%

BLOW TORCHES (See Firepots).

BOARDS.

Stove.		Per Doz.
26x26, wood lined		$14 45
28x28, "	"	16 95
30x30, "	"	19 00
26x26, paper lined		8 15
28x28, "	"	9 10
30x30, "	"	10 80

Wash.
No. 760, Banner Globe (single) ..... per doz. $5 25
No. 652, Banner Globe (single) ..... per doz. 6 75
No. 801, Brass King, per doz. 8 25
No. 860, Single—Plain Pump 6 25

BOLTS.

Carriage, Machine, etc.
Carriage, cut thread, ⅝x6 and sizes smaller and shorter 50%
Carriage sizes, larger and longer than ⅝x6 ..... 40-5%
Machine, ⅝x4 and sizes smaller and shorter 50%
Machine, sizes larger and longer than ⅝x4 ..... 75%
Stove 75%
Mortise, Door.
Gem, iron 5%
Gem, bronze plated 5%
Barrel.
Cast ..... Net
Wrought ..... "
Wrought, bronzed ..... "
Flush.
Wrought ..... Net
Spring.
Wrought ..... "
Wrought, heavy ..... "
Square.
Wrought ..... "

BOXES.

Mail. No.	2	4	10
Per doz.	$18 00	$23 00	$29 00

Cast Iron.
Per doz. $9 50
Mitre.
Stanley's ..... Net Prices
Stearns, No. 2 .. per doz. $30 00

BRACES, RATCHET.

V. & B. No. 444 8 in. $4 54
V. & B. No. 222 8 in. 3 89
V. & B. No. 111 8 in. 3 55
V. & B. No. 11 8 in. 3 02

BURRS, RIVETING.

Copper Burrs only 40-5%
Tinners' Iron Burrs only ..... Net

BUTTS.

Steel, antique copper or dull brass finish—case lots—
3½x3½ ... per dozen pairs $3 24
4x4 " " " 4 44
Heavy Bevel steel inside sets, case lots— ..... per dozen sets 7 20
Steel bit keyed front door sets, each 1 20
Wrought brass bit keyed front door sets, each 3 30
Cylinder front door sets, each 7 50

CALIPERS.

Double ..... Net
Inside and Outside ..... "
Wing ..... "

CARRIERS.

Hay.
Diamond, Regular ... each, net
Diamond, Sling ..... " "

CASTERS.

Standard—Ball Bearing. ..... 50 & 10%
Bed 40%
Common Plate.
Brass Wheel 15%
Iron and porcelain wheels, new list 50%
Philadelphia Plate, new list 50%
Martin's 40%

CATCHERS, GRASS.

No. 160S ..... per doz. $12 25
No. 165S ..... " " 14 01

CEMENT, FURNACE.

American Seal, 5 lb. cans, net $ 45
" " 10 lb. cans, " 90
" " 25 lb. cans, " 2 00
Asbestos, 5 lb. cans " 45
Pecora ..... per 100 lbs. 7 51

CHAINS.

Proof Coil, ⅜" 100 lbs. .... $ 3 75
Weldless Coil, ... 50-5%
Electric Cow Welded Ties, No. 00, 4½, per doz. 2 35
Safety.
12 yds., per box 75
500 ft. spools, per ft. 02

CHALK, CARPENTERS'.

Blue	per	gro.	$2 00
Red	"	"	2 00
White	"	"	1 80
Common White School Crayon	"	"	0 30

CHIMNEY TOPS.

Iwan's Complete Rev. & Vent. 30%
Iwan's Iron Mountings only .. 35%

CHECK, DOOR.

Corbin ..... Net list
Russwin ..... Net list

CHISELS.

Cold.
V. & B. No. 25, ¼ in., each $0 26
V. & B. No. 25, ⅝ in., each 41
Diamond Point.
V. & B. No. 55, ¼ in. 0 32
V. & B. No. 55, ½ in. 0 48
Firmer Bevelled.
Round Nose.
V. & B. No. 65, ¼ in. 0 29
V. & B. No. 65, ½ in. 0 40
Socket Firmer.
Cape.
V. & B. No. 50, ⅜ in. 0 31
V. & B. No. 50, ⅝ in. 0 57

CHUCKS, DRILL.

Goodell's, for Goodell's Screw Drivers ..... List less 35-40%
Yankee, for Yankee Screw Drivers $6 00

CLAMPS.

Adjustable.
Martin's 30%
No. 63, Screw 20%
No. 100, Door (Stearns) doz. $22 00
Cabinet.
Screw 20%
Carpenters'.
Steel Bar .. List price plus 20%
Carriage Makers'.

2½-inch	per doz.	$ 7 00	
5 - "	"	14 00	
8 - "	"	28 00	
12 - "	"	42 00	

Hose.
Sherman's brass, ¾-inch per doz. $0 48
Double, brass, ¾-inch, per doz. 1 20
Saw Filers.
No. 1, Adjustable (Stearns) doz. ..... $ 8 75

CLAWS, TACK.

Wood hdl. No. 10	per doz.	$1 15
Forged steel, wood hdl.	"	2 15
Solid steel	"	3 25
Giant	"	50

CLEVISES.

Malleable ..... 10c lb.

CLIPPERS.

Bolt (Carolus).
No. 0 ..... $2 50
No. 1 ..... 3 25
No. 3 ..... 4 25

CLIPS.

Axle ..... 65 & 5%
Damper.
Acme, with tail pieces, per doz. $1 25
Non Rivet tail pieces, per doz. 25
Non Rivet Clips 20
Hame 50

COLLARS, STOVE PIPE.

Lacquered.

Inches	5	6	7
Fancy pattern, per doz.	65c	75c	$4 00

COMPASSES.

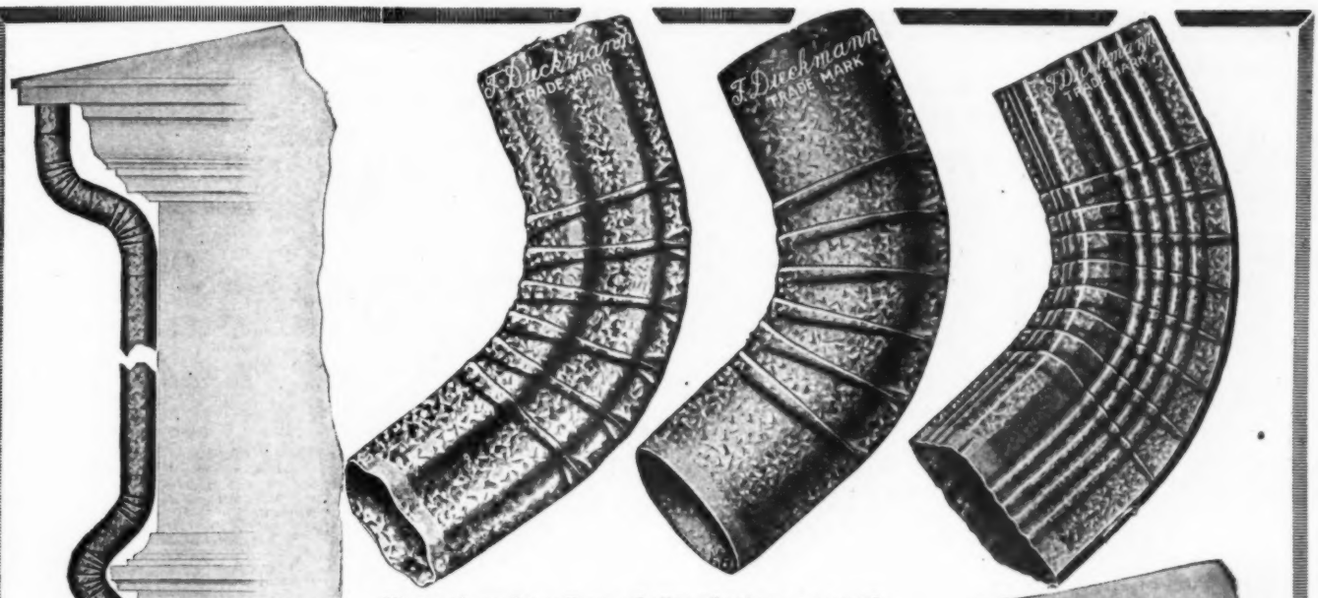
Carpenters' 15%

COPPERS—Soldering.

Pointed Roofing.
3 lb. and heavier .... per lb. 40c
2½ lb. ..... " 45c
2 lb. ..... " 48c
1½ lb. ..... " 55c
1 lb. ..... " 60c

CORD.

No. 7 Std. per doz. hanks .. $10 35
No. 8 " " " " 11 95

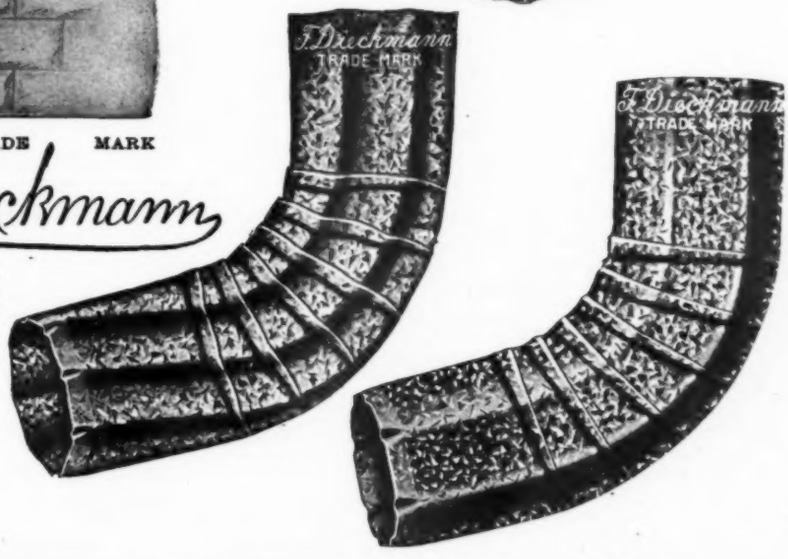


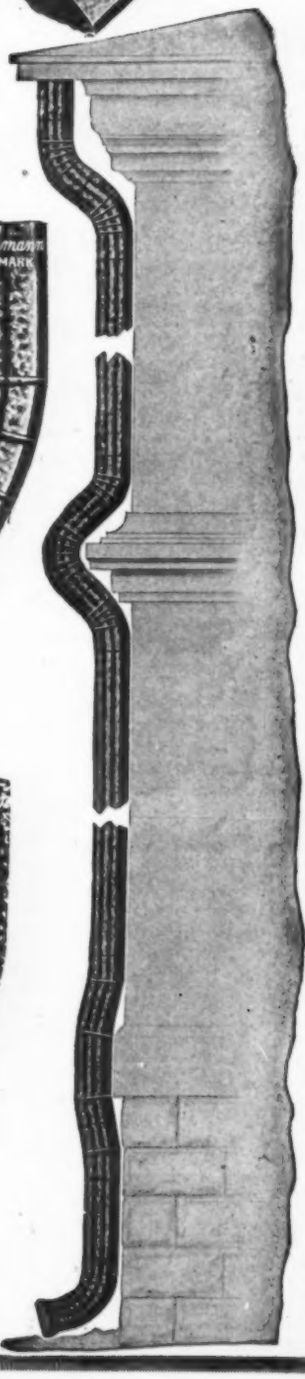
Illustrations show elbows of all angles from 10 to 90°. Note how close each cluster of elbows hugs the walls.

Use short angle elbows to get around sills, cornice mouldings and all other projections, thus preventing the commonly known soldered break in the pipe.

By using combinations of this kind, soldering is not necessary as elbows fit into each other very snug and the small opening at the joints will permit sewer gases to escape, thus increasing the life of the entire spout.

These elbows are made in all designs and your dimensions can be arranged right on the job.





TRADE MARK

F. Dieckmann

This Emblem of Quality is stamped in each.

THE FERDINAND DIECKMANN COMPANY

P. O. Station B **Cincinnati, Ohio**

COTTERS, SPRING.
All sizes 87½%

COUPLINGS, HOSE.
Brass.....per doz. $2 25

CUT-OFFS.
Standard gauge.....35%
26 gauge.....20%
Kuehn's Korrekt Kutoffs:
Galv., plain, round or cor. rd.
Standard gauge 40%
26 gauge 10%

DAMPERS, STOVE PIPE.
Diamond.
6-inch.....per doz. $1 50
Cast "American."
6 inch per doz.....$1 50
7 " " " 2 25
8 " " " 3 00
9 " " " 5 40
10 " " " 6 75
12 " " " 8 00
Check.
7 inch, each.....$1 00
8 " " 1 25
9 " " 1 50
10 " " 1 75
12 " " 2 25
Steel Hot Air.
8 inch per doz.....$2 50
9 " " 2 75
10 " " 3 00
12 " " 3 50
14 " " 4 50

DIGGERS.
Post Hole.
Iwan's Split Handle (Eureka)
4-ft. Handle...per doz. $14 00
7-ft. Handle...per doz. 36 00
Iwan's Hercules pattern, per doz. 14 90

DRILLS.
V. & B. Star, 12-inch Length.
¼, 5/16 and ⅜, each.....$ 25
⅝, each 36
1, each 54
1¼, each 81
V. & B. Star, 18-inch Length.
5/16 and ⅜, each.....$ 32
⅝, each 45
1, each 69
1¼, each 1 05

EAVES TROUGH.
Milcor .....
Galv. Crimpedge, crated.....75%

ELBOWS—Conductor Pipe.
Galvanized Steel, Tin and Terne Plain Round or Round Corrugated
2 to 6 inch, Std. gauge ..65%
2 to 6 inch, 26 gauge 45%
2 to 6 inch, 24 gauge 20%
Milcor .....
Galv., plain or corrugated, round flat.
Crimp. Std. gauge.....65%
26 Gauge Std. gauge.....45%
24 Gauge Std. gauge.....15%
Square Corrugated.
Standard gauge 50%
26 gauge 30%
Milcor .....
Standard gauge 50%
26 gauge 35%
Portico Elbows.
Standard Gauge Conductor Pipe, plain or corrugated.
Not nested .....70 & 5%
Nested solid.....70 & 5%

ELBOWS—Stove Pipe.
1-piece Corrugated. Uniform.

	Doz.
5-inch	$1 38
6-inch	1 54
7-inch	1 98

Special Corrugated.

	Doz.
6-inch	$1 27
7-inch	1 76

Uniform, Collar Adjustable.

	Doz.
5-inch	$1 76
6-inch	1 98
7-inch	2 48

WOOD FACES—50% off list.

FENCING.
Lawn fence, single space, 36-inch .....$ 9 12
Lawn fence, single space, 42-inch 10 20
Lawn fence, double space, 32-inch 12 50
Lawn fence, double space, 42-inch 18 75
Field fence, 26-inch, No. 10 top and bottom 12 filling 26 50
Same, 6 filling..... 33 62
Field fence, 32-inch, No. 10 top and bottom 12 filling 30 34
Same, 6 filling..... 39 41

FILES AND RASPS.
Heller's (American).....65-5%
American 65-5%
Arcade .....60 & 10%
Black Diamond 50-5%
Eagle 60-10%
Great Western .....60 & 10%
Kearney & Foot.....60 & 10%
McClellan .....60 & 10%
Nicholson 50-10%
Simonds 60%
J. Barton Smith.....50-10-5%
X F .....Net list

FIRE POTS.
Clayton & Lambert's.
East of west boundary line of Province of Manitoba, Canada, No. Dakota, So. Dakota, Nebraska, Kansas, Oklahoma, Amarillo, San Angelo and Laredo, Texas 55%
West of above boundary line..52%

Turner Brass Works.	Ea.
No. 43 Kerosene-Gasolene Master Torch, 1 qt.....	$5 40
No. 48 Kerosene-Gasolene Master Torch, 1 qt.....	6 73
No. 95 Double Jet Torch, Gasolene, 1 qt.....	6 95
No. 30 Kerosene-Gasolene Torch, 1 qt. (new line)..	6 48
No. 33 Single Jet Gasolene Torch, 1 qt.....	6 93
No. 53 Plbrs. Furn. Galv. Iron Tank with Bulb, 7 pts.	6 75
No. 63 Plbrs. Furn. Galv. Iron Tank with Pump, 7 pts.	7 47
No. 56 Plbrs. Furn. Straight Side Steel Tank with Bulb, 7 pts.....	8 32
No. 66 Plbrs. Furn. Straight Side Steel Tank, with Pump, 7 pts.....	9 54

Otto Bernz Co.
No. 1 Furn. Gasolene with large shield, 1 gal.....$ 6 75
No. B Furn. Kerosene, 1 gal. 15 12
No. 10 Brazier, Kerosene or Gasolene, 10 gals... 47 52
No. 5 Torch, Gasolene or Kerosene, 1 pt..... 7 92
No. 83 Torch, Gasolene, 1 quart 5 40
No. 86 Torch, Gasolene, 1 pt. 4 05

GALVANIZED WARE.

	Per doz.
*Pails (Competition), 8-qt...	$1 85
10-qt.	2 00
12-qt.	2 35
14-qt.	2 50
Wash tubs, No. 1.....	6 85
No. 2	7 00
No. 3	7 75

GARAGE DOOR HARDWARE.
Stanley .....All net

GAUGES.
Marking, Mortise, etc.....Nets
Wire.
Disston's 25%

GIMLETS.
Discount.....65% and 10%

GLASS.
Single Strength, A. and B. all sizes.....83 & 84%
Double Strength, A, all sizes 79%
Double Strength, B, all sizes, 85%

GLUE.
Bulk.
B Amber .....per lb. 35c
A White ..... " 40c
H. S. Amber..... " 32c
Liquid.
Army & Navy.....40%
Le Page's—
List "A" 37½%
List "B" .....35 %
List "C" .....25 %

GREASE, AXLE.
Wood Boxes.
Frazer's .....per gro. 12 00
Hub Lightning 7 50
Wood Pails.
Frazer's, 15 lb., $1.00; 25 lb., $1.50 each.
Hub Lightning, 15 lb., 90c; 25 lb., $1.21 each.

HAFTS, AWL.
Brad.
Common .....per doz. $0 35
Peg.
Patent, plain top. " 60
Patent, leather top " 80
Sewing.
Common ..... " 24
Patent ..... " 55

HAMMERS, HANDLED.

All V. and B.	Each, net
Blacksmiths' Hand, No. 0 26-oz.	$1 00
Engineers' No. 1, 26-oz.....	1 00
Farriers', No. 7, 7-oz.....	93
Machinists', No. 1, 7-oz....	78
Nail.	
Vanadium, No. 41, 20-oz., each	1 45
Vanadium, No. 41½, 16-oz., each	1 45
V. & B., No. 11½, 16-oz., each	1 04
Garden City, No. 111½, 16-oz., each	87
Tinner's Riveting, No. 1, 8-oz., each	82
Shoe, Steel, No. 1, 13-oz., each	65
Tack.	
Magnetic.	
No. 5, 4-oz., each.....	72

HAMMERS, HEAVY.
Farrier's 20%
Mason's.
Single and Double Face....50%

HANDLES.
Agricultural Tool.
4½-inch, plain...per doz. $3 50
Auger.
Common Assorted, per doz. $0 75
Pratt's Adjustable, Nos. 1 & 2, per doz..... 6 00
Ives' Adjustable, per set.. 1 35
Axe.
Hickory, No. 1....per doz. 3 00
Hickory, No. 2.... " 2 00
1st quality, second growth 6 00
Special white, 2nd growth 4 50
Chisel.
Hickory, Tanged, Firmer Assorted .....per doz. 55c
Hickory, Socket Firmer, Assorted .....per doz. 70c
Coal Pick 40%
Drifting Pick 40%
File, ...per doz. $1 20
Hammer and Hatchet.
No. 1 per doz.....$0 90
Second growth hickory, per doz. 1 40
Hay and Manure Fork, Handles, Strap and Ferrule ..... per doz. $7 00
Screw Driver.
Assorted .....each 6c
Shovel and Spade.....Net
Soldering.
Per doz. $2 40

HANGERS.
Conductor Pipe.
Milcor Perfection Wire.....25%
Eaves Trough.
Steel hangers 30%
Triple Twist wire.....10%
Milcor Eclipse Wire.....15%
Milcor Triplex Wire.....10%
Milcor Milwaukee Extension..10%
Milcor Steel (galv. after forming) List plus 12½%
Milcor Selflock E. T. Wire, List plus 40%

HASPS.
Hinge, Wrought, with staples.Net

HATCHETS.

V. and B. Supersteel.	Each
Broad, No. 1, 24-oz.....	$1 43
Broad, No. 3, 22-oz.....	1 78
Half, No. 1, 15-oz.....	1 25
Half, No. 3, 27-oz.....	1 37
Claw, No. 1, 19-oz.....	1 31
Claw, No. 2, 25-oz.....	1 37
Flooring, No. 1, 20-oz.....	1 43
Flooring, No. 2, 24-oz.....	1 60
Shingling, No. 1, 17-oz.....	1 20
Shingling, No. 2, 23-oz.....	1 25
Lathing, No. 1, 14-oz.....	1 20
Lathing, No. 2, 17-oz.....	1 25
Vanadium Steel.	
Half, No. 62, 22-oz.....	$1 82
Underhill Pattern Lathing, 9 row, 19-oz.....	2 29

HINGES.
Heavy Strap, in Bundles.
4 inch, dozen. prs.....$1 02
5 " " " 1 24
6 " " " 1 70
8 " " " 2 80
Extra Heavy T in Bundles.
4 inch, dozen prs.....$1 56
5 " " " 1 65
6 " " " 2 05
8 " " " 3 51

HOES.
Garden .....Net

HOOKS.
Box.
V. and B. No. 9, each....$0 26
Conductor.
Conductor hooks 20-10%
Milcor .....
"Direct Drive" Wrought Iron for wood or brick..15%
Cotton.
V. and B. No. 8, each.... 24
Hay.
V. and B. No. 1, each.... 26
Bar Meat.
V. and B. No. 26, ⅝", each 09
V. and B. No. 28, ½", each 16
Screw Meat.
V. and B. No. 2, per gro.. 6 50
Butchers' "S."
V. and B. No. 6, each..... 08
V. and B. No. 8, each..... 11

HOSE.

	Per Ft.
⅝-in. 2 ply molded..	9½c to 12¾c
⅝-in. cord	8½c to 10c
¾-in. wrapped	9½c to 13½c

IRONS.
Sad.
Charcoal .....per doz. 11 00
Common, polished, per 100 lbs. 7 75
No. 70 Asbestos.....$1 50 net
No. 100 " ..... 1 75 net
Common, nickel plated 8 25
Mrs. Potts.'
No. 50 J. Enterprise, per set Nets
No. 55 J, " " "
No. 50 T, " " "
No. 55 T, " " "
E. C. Stearns.'
No. OA Corner, doz. sets.$2 50
No. OB " " " 2 75

JACKS.
Wagon.
Richard's No. 1.per doz. $15 50
Oliver,
Each $0 60 $0 80
Nos. 0 00
Standard,
Each $0 60 $1 00
Nos. 1 2
Big Lift 40%
Tiger 40%

KNIVES.
Beet Topping.
Clyde, 9-in. Scimitar Blade, doz. 25%
California 25%
Butcher.
Beechwood Handles, 6-inch blade 25%
Beechwood Handles, 7-inch blade 25%
Beechwood Handles, 8-inch blade 25%
Cooper's Hoop 25%
Drawing.
Standard 25%
Adjustable 25%
Barton's Carpenters' 25%
Hay.
Iwan's Solid Socket.....25%
Heath's 25%
Iwan's Sickle Edge.....25%
Iwan's Imp'd Serrated....25%
Hedge.
Challenge 25%
Disston's No. 1.....25%
Putty.
Common 25%
Lander's 25%
Scraping.
Beech Handle 25%
Lander's 25%

KNOBS.
Door.
Mineral .....per doz. $2 00
Porcelain ..... " 2 00
Jet ..... " 2 00

LADDERS.
Step.
Common, per ft.....28c
Common, with Shelf, add 10c
IXL 34c
Challenge, 6 to 9 ft.....55c
10 to 16 ft.....60c

LANTERNS.

	Per doz.
Monarch tin, hot blast.....	$ 8 25
Dietz No. 2, cold blast.....	13 00
Best tubular	8 25
Competition lanterns No. 0 tubular	6 90

LEATHER BELTING.
From No. 1 Oak Tanned Butts.
Extra heavy, 18-oz.....35%
Heavy, 16-oz.....40%
Medium, 14½-oz.....40%
Light, 13-oz.....50%

LEATHER LACING.
Cut, strictly No. 1.....45%

LEVELS.

Disston, No. 28 Asst.....	$22 05
" No. 18, 20 in., each	1 83
" No. 22, 24 in., each	2 40
" Shafting, 6 in.....	19 80
" " 6 in. gr. glass	24 20
" No. 1 Asst.....	5 75
" No. 2 Asst.....	12 40
" 24-26 in., each....	1 02
" 28-30 in., each....	1 00

LIFTERS.
Stove Cover.
Coppered .....per gro. $6 00
Alaska ..... " 4 75
Transom.
Payson's 55%

LOCKS.
Barn Door.
No. 60 Stearns..per doz. $11 00
No. 80 " " 20 00

MALLETS.
Carpenters'.
Fibre Head, No. 2, per doz. $12 00
" No. 3, " 15 50
" No. 3½ " 20 50
Round Hickory .....per doz $3 00— 5 00
Tinners'.
Hickory .....per doz. $2 25

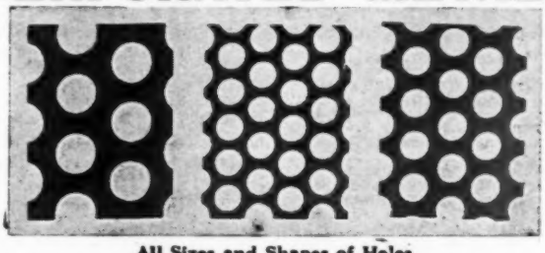
INLAND COPPER ALLOY SHEETS

INLAND STEEL COMPANY
38 So. Dearborn Street, Chicago

Works:
Indiana Harbor, Ind.
Chicago Heights, Ill.

Branch Offices:
Milwaukee, Wis. St. Louis, Mo.
St. Paul, Minn.

PERFORATED METALS



All Sizes and Shapes of Holes
In Steel, Zinc, Brass, Copper, Tinplate, etc.
For All Screening, Ventilating and Draining
EVERYTHING IN PERFORATED METAL

THE HARRINGTON & KING PERFORATING CO.
610 NORTH UNION ST.—CHICAGO, ILL., U. S. A.
NEW YORK OFFICE, 114 LIBERTY ST.

RIGID	*EFFICIENT*	*STRONG*
AREX VENTILATOR A SIPHONAGE principle ventilator assuring natural, even exhaust. The Arex does the work of three ordinary ventilators. Never fails to satisfy in operation and lasting qualities.		**AREX VENTILATOR** Here is a money maker for you. Reasonably priced to give you a good profit. Easy to install—has no movable parts—is stormproof, rigid and extraordinarily strong. Write today and let us send you our latest catalog and price list.

AREX COMPANY
Room 1581 Conway Bldg., 111 W. Washington St., Chicago, Ill.

Earn from $1000 to $2000 more in 1923!

TIN, COPPER AND SHEET IRON WORK GALORE

New Building Wave—New Buying Power is upon us.

What is your share? Why not get more? Our Wonderful Studies will positively help YOU. Every subject is a specialist of its kind; exhaustive and comprehensive in every detail.

Modern Shop Work
Warm Air Heating
Outside Jobbing
Ventilators
Round Pipe Studies
Advanced Triangulation
Architectural Cornice Work
Skylight, Marquee and Windows
Mensuration Studies
Automobile S. M. Work
Exhaust and Blow Pipe Engineering
Indirect Heating and Ventilating

This wonderful Study has taken 4-1/2 years to finish; it's 2/3rds larger than any other course on the market. It is the fullest representation of the Trade as it must be done today—not as the trade was from 10 to 20 years ago, as so many books and certain Courses date back to.

Here we teach you in Your Own Home, Personal, Clear, Direct, to Read Plans, do Correct Designing; Artistic Detailing; The Greatest Knowledge of Pattern Drafting; The Planning out Jobs in every Branch and to supervise their Construction like an Engineer.

LEARN TO DO THINGS BIG—SUCCESSFUL and PROFITABLE

How many Tradesman are going to enter business this year? How many expect to enlarge their business? 1806 failed in October—what assurance have you for Success?

Our Studies in Business Management are 99% insurance against Failure. Such wonderful subjects as:

BUSINESS ECONOMICS, covering the fundamentals of Business.

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Special Studies can be arranged to meet any Merchant's or Contractor's business requirements. Full information concerning any Course you are interested in will be sent you FREE. Write NOW.

☐ SHEET METAL DESIGN AND DRAFTING
☐ BUSINESS MANAGEMENT
☐ FAN HEATING AND VENTILATION ENGINEERING

ST. LOUIS TECHNICAL INSTITUTE

O. W. KOTHE, Prin.

4543 Clayton Avenue ST. LOUIS, MO.

MATS.

Door.
National Rigid ....5 & 10 & 5%
Acme Steel Flexible.....50%

MEASURES.

Galvanized, doz.....Nets
Japanned, doz. .....Nets

MITRES.

Galvanized steel mitres, and caps, end pieces, outlets...30%
Milcor .....
Galv. one piece stamped....40%

MOPS.

Cotton, Star (Cut Ends).

Pounds	12'	15'	18'	24'-3-oz.
Per doz.	$4 00	4 35	5 50	7 00

Enterprise 16⅔%
Parker .....50 & 5%

NAILS.

Cut Steel $4 60
Cut Iron 4 60
Wire.
Common 3 45
Cement Coated.
Small Lots 2 30
Horseshoe.
Ausable .....55 & 5%
Capewell 15%
Perfect .....55 & 5%
Putnam .....20 & 5%
Star .....30 & 5%
Picture.
Brass Heads 25%
Brads 70%
Furniture.....List plus 15%

NETTING, POULTRY.

Galvanized before weaving...50%
Galvanized after weaving...40%

NIPPERS.

Nail Cutting.
V. & B. No. 30.....73c
Double Duty.
V. & B. No. 60.....76c
Hoof.
Heller's .....40 & 10%
V. & B., No. 52, each.....$2 25

NOZZLES.

Hose.
Magic .....per doz. $9 50
Diamond ..... " 5 75

OILERS.

Chase Pattern.
Brass and Copper.....10%
Zinc Plated.....40 & 5%
Railroad.
Brass .....20&5%
Coppered .....50&5%
Steel.
Copper Plated.....70 & 5%

OPENERS.

Can.
Delmonico .....per doz. $1 30
Never Slip ..... " 65
Crate.
V. & B.....per doz. $7 25-11 00

PAILS.

Cream.
14-qt. without gauge, ...per doz. $9 50
18-qt. without gauge, ...per doz. 11 00
20-qt, without gauge, ...per doz. 11 75
Sap.
10-qt., IC Tin....per doz. $4 00
12 " " " " 5 50
Stock.

Galv. qts.	14	16	18	20
Per doz.	$9 75	10 75	12 75	14 50

Water.

Galvanized qts.	10	12	14
Per doz.	$5 75	6 50	7 25

Wood.
Cable, 2-Hoop....per doz. Nets
Cable, 3-Hoops... " Nets
Cable, 3-Hoops, brass " Nets

PANS.

Dripping .....Net
Fry.
Common .....Nets
Acme ..... "
Roasting.
Paxton,

Nos.	1	2	3	4
Per doz.				Nets

PAPER.

Roofing.	Per Square
Best grade, slate surf. prepd.	$1 85
Best talc surfaced.....	3 25
Medium talc surfaced.....	1 60
Light talc surfaced.....	0 90
Red Rosin Sheathing, per ton	55 00

PICKS.

Contractors' 40%
Railroad .....50 & 5%

PINCERS.

All V. & B.
Carpenters', cast steel,

No.	6	8	10	12
Each	$0 42	$0 52	$0 61	$0 71

Blacksmiths', No. 10.....$0 64

PINS.

Clothes.
Common, per box of 5 gro. $0 95

PIPE.

Conductor.
"Interlock" Galvanized.
Crated and nested (all gauges) 60-20%
Crated and not nested (all gauges) 60-15%
Square Corrugated A and B and Octagon.
29 Gauge 65%
28 " 65%
26 " 65%
24 " 65%
"Interlock."
Crated and nested (all gauges) 60-20%
Prices for Galvanized Toncan Metal, Genuine O. H. Iron, Lyonmore Metal and Keystone C. B. on application.

Stove.	Per 100 joints
26 gauge, 5 inch E. C. nested	15 40
26 gauge, 6 inch E. C. nested	16 50
26 gauge, 7 inch E. C. nested	18 70
28 gauge, 5 inch E. C. nested	13 20
28 gauge, 6 inch E. C. nested	14 30
28 gauge, 7 inch E. C. nested	16 50
30 gauge, 5 inch E. C. nested	11 00
30 gauge, 6 inch E. C. nested	12 10
30 gauge, 7 inch E. C. nested	14 30

T-Joint Made up.
6-inch .....per 100 38 50

Furnace Pipe.
Double Wall Pipe and Fittings 40%
Single Wall Pipe, Round Pipe Fittings 40%
Galvanized and Back Iron Pipe, Shoes, etc.....40%
Milcor, galvanized.....40%

PLANES.

Stanley Iron Bench.....Net

PLIERS.

(V. & B.)
Nut, No. 3, each.....$2 60
" No. 5, each..... 64
" No. 25, each..... 69
Gas, No. 7, each..... 55
" No. 8, each..... 61
" No. 12, each..... 87
Lining or Crimping.
No. 35, each..... 64
Button's Pattern.
No. 6 each..... 61
No. 8 each..... 74
Double Duty, No. 106..... 50

POINTS, GLAZIERS.

No. 1, 2 and 3...per doz. pkgs. 65c

POKERS, STOVE.

Wr't Steel, str't or bent, ... per doz. $0 75
Nickel Plated, coil hand's " 1 10

PULLEYS.

Awning—Jap'd 10%
Clothes Line 10%
Hay Fork.
Iron Wheel, 5-in..per doz. $2 50
Wood Wheel, 6-in. " 2 65
Wood Wheel, 6-in. pass knot ..... " 3 00
Sash.
Common .....Net
Common-Sense, 2-in .....Net
Empire Pattern, 2-in.....Net
Ideal .....Net
Steel .....Net

PUMPS.

Spray.
Midget Junior....per doz. $3 75
New Misty ..... " 6 00
Crescent ..... " 6 50

PUNCHES.

Machine.	Each
V. & B., No. 11-13, ⅛x6...	$ 19
V. & B., No. 90, ⅜x9.....	27
V. & B., No. 10, ¾x10.....	29
V. & B., No. 1-6, ½x6.....	12
Center.	
V. & B., No. 50, ⅜x4.....	14
Belt.	
V. & B., No. 101-103.....	24
V. & B., No. 108-109.....	32
V. & B., No. 25, ass't.....3	80
Parker Metal Punch No. OX .....each	$7 00
Parker Extra Punch.	30
Parker Extra Die.....	40
Whitney's Ball Bearing.. .....Prices on application	

PARERS.

Apple.
Goodell's .....per doz. $10 80
Turntable ..... " 11 40
White Mountain " 8 40
Reading No. 78 " 11 40

PUTTY.

Commercial Putty, 100-lb. kits $3 60

RAKES.

Garden.	Per doz.
Steel, Bow, 12-inch Teeth	$8 50
Steel, Bow, 14-inch "	9 25
Malleable Iron, 12-in. "	4 75
Malleable Iron, 14 in. "	5 00
Hay.	
Wood, 10 Teeth.....$4 00	
Lawn.	
$0 Teeth .....per doz. 5 50	

RAZORS—SAFETY.

Gillette .....per doz. $45 00
Auto Strop ..... " 45 00
Gem ..... " 8 40
Gem (3 doz. lots).. " 8 00
Ever Ready ..... " 8 40
Ever Ready (3 dz. lots)" 8 00

RAZORS STRAIGHT.

RAZOR STROPS.

Star (Honing) 50%

FLOOR REGISTERS AND BORDERS.

Cast Iron 15%
Steel and Semi-Steel.....30%
Baseboard 30%
Adjustable Ceiling Ventilators 30%
Register Faces—Cast and Steel
Japanned, Bronzed and Plated, 4x6 to 14x14.....30%
Large Register Faces—Cast, 14x14 to 38x42.....50%
Large Register Faces—Steel, 14x14 to 38x42.....60%

REGULATORS.

(Parker Dial Damper with Bearings.)
Each .....$ 50
Per doz. 5 50

RIDGE ROLL.

Galvanized.
Milcor .....
Plain, crated 75%
Plain, bundled 75-2½%

RIVETS.

Copper Belt .....50% Discount
Coppered Iron 50%
Tinners' 50%
Hame..... per lb. $0 17
Slotted Clinch per doz. 60 @ 1 10
Tubular.
Nos. 1 and 2 assorted sizes, 50 in box.....doz. 75c
Nos. 1 and 2 assorted sizes, 10 in box.....doz. 1 40

ROPE.

Cotton.
¼, 5-16 in. and larger, per lb. .....50c to 60c
Sisal.
1st Quality, base 13½c to 15½c
No. 2.....12½c to 14½c
Manila.
1st Quality standard brands .....16½c to 18½c
No. 2 .....15½c to 16½c
Hardware Grade, per lb. 15½c

SAWS.

Butchers'.
Atkins No. 2, 14-in.....$12 75
" No. 2, 18-in..... 14 80
" No. 7, 16-in..... 15 85
" No. 2, 22-in..... 15 92
" No. 7, 20-in..... 18 05
" No. 7, 24-in..... 20 20
" No. 7, 28-in..... 22 35
Compass.
Atkins No. 2, 10-in.....$ 5 45
" No. 10, 10-in..... 5 60
" Blades, No. 2, 10-in. 3 25
" " No. 2, 10-in. 3 30
Cross-Cut.
Atkins No. 221, 4-ft..... 3 03
" No. 221, 6-ft..... 4 45
" No. 221, 8-ft..... 6 07
Flooring, Hand.
Atkins No. 96, 16-in..... 20 45
" No. 96, 20-in..... 21 70
Hand and Rip.
Atkins No. 54, 20-in..... 19 50
" No. 54, 26-in..... 24 40
" No. 53, 16-in..... 18 10
" No. 53, 20-in..... 22 90
" No. 53, 24-in..... 26 60
" No. 53, 28-in..... 31 45
" No. 53, 30-in..... 34 15
Keyhole.
Atkins No. 1, complete.. 3 10
" No. 2, complete.. 3 70
Miter Box.
Atkins No. 1, 4x20..... 32 65
" No. 1, 5x22..... 38 00
" No. 1, 6x22..... 42 20
Pruning.
Atkins No. 20, 12-in.... 3 45
" No. 10, 16-in.... 18 15
Wood.
Atkins No. 202..... 7 19
" No. 318..... 8 75
" No. 906..... 15 50
" No. 1509..... 16 56

SCOOPS.

Hubbard Western Pattern Riveted.

Size	A	B	C	D
1..	$16 75	16 00	15 25	14 45
4..	17 85	17 10	16 35	15 60
6..	18 65	17 85	17 10	16 35

SCRAPERS.

Box.
No. 6, six blades, each.... 25c
Hog.
No. 6, each..... 25c
Floor (Stearns).
No. 10, each.....$11 50

SCREEN DOOR HINGES.

Cast iron .....gross $13 00
Steel ..... " 9 50

SCREWS.

Jack.....Standard List 45%
Lag or Coach—all sizes, gimlet pointed 40-10%
Wood.
F. H. Bright.....$2-5%
R. H. Blued.....75-20-5%
F. H. Jap'd.....70-20-5%
F. H. Brass.....75-5%
R. H. Brass.....70-20-5%
Sheet Metal.
No. 7, ½x½, per gross...$ 55
No. 10, ⅜x3/16, per gross.. 75
No. 14, ⅛x¼, per gross... 90

SCREW DRIVERS.

Uncle Sam Standard Head.
2 inches, each.....$ 45
5 inches, each..... 52
8 inches, each..... 68
12 inches, each.....1 02
Uncle Sam Insulated Head
3 inches, each.....$ 49
5 inches, each..... 57
8 inches, each..... 76
12 inches, each.....1 14

SETS.

Nail
V. & B.
No. 100, in cardboard boxes .....doz. $1 54
No. 100, in wooden boxes, ... doz. 1 58
No. 30, assorted....doz. 39
No. 5, in cardboard boxes, ... doz. 1 25
No. 5, in wooden boxes, ... doz. 1 30
Rivet.
V. & B.
Farmers' $0 19
Tinners' 3-4 ..... 0 40
" 00-0 ..... 0 60
Saw.
Atkins No. 10....per doz. $3 30
" No. 12.... " 4 20

Galvanized
One Pass Cold Rolled

SHEETS

Corrugated
Blue Annealed

PRIME QUALITY at the RIGHT PRICE

WE HAVE a large stock from which you can secure all standard sizes and gauges of sheet steel. Corrugated sheets, galvanized, black or painted. Write us today for prices on your requirements. We make prompt shipments.

WE MAKE A SPECIALTY OF FABRICATING STEEL SHEETS TO YOUR ORDER—ASK US ABOUT THIS SERVICE

THE SYKES COMPANY
930 West 19th Place CHICAGO, ILL.

Memorial Monuments
Write for Prices and Illustrations
Gerock Bros. Mfg. Co.
Sheet Metal Ornaments and STATUARY
1252 So. Vandeventer Ave.
St. Louis, Mo., U. S. A.

QUALITY & BEAUTY
IN
ART METAL CEILINGS
AND
SIDE WALLS

QUALITY—only first quality material is used in making **FRIEDLEY-VOSHARDT ART METAL CEILINGS AND SIDE WALLS.**

BEAUTY—is necessary for the ***complete*** and ***lasting*** satisfaction of your customers.

Having one of the finest equipped sheet metal plants in the country and employing only skilled workers enables us to serve you with ***QUALITY*** goods having the ***BEST DESIGNS.***

WRITE TODAY FOR CATALOG No. 33

FRIEDLEY-VOSHARDT CO.

OFFICE 733-737 S. Halsted St. FACTORY 761-771 Mather St.
CHICAGO, ILLINOIS

CORTRIGHT METAL SHINGLES

When it comes to Galvanized Shingles, use Cortright Hand Dipped. They are first formed of prime roofing tin, and then coated separately in a zinc bath, receiving a heavy coating on both sides.

Cortright Metal Roofing Co.
Philadelphia—Chicago

ILLINOIS ZINC COMPANY
332 So. Michigan Ave., Chicago, Ill.
280 Broadway, New York City
1331 Filbert St., Philadelphia, Pa.
Smelters and Rolling Mills, Peru, Ill.
Established 1870

ILLINOIS ZINC SHINGLES
THE ROOF THAT'S ALWAYS NEW

Plecker's Galvanized Eave Trough and Corrugated Expanding Conductors

Made of Keystone Copper Bearing Steel — Costs no more, Lasts Longer, Therefore Cheapest

CLARK-SMITH HARDWARE CO. **PEORIA, ILLINOIS**

"THE STANDARD"
VENTILATOR and CHIMNEY CAP

DOES away with high stacks, swings freely in the slightest breeze and positively cures down-drafts. The strongest and most efficient combination to be had. Has no equal for chimney purposes. All jobbers sell them—write your jobber or us for prices and catalog today.

Manufactured by
STANDARD VENTILATOR CO.
LEWISBURG, PA.

SHEARS.

	Per Doz.
Nickel Plated, Straight, 6"	$12 90
" " " 7"	14 85
" " " 8"	16 80
Japanned, Straight ....6"	11 00
" " ....7"	12 40
" " ....8"	13 80

SHEAVES, SLIDING DOOR.

Common.

Inches	3	4	5
Per set	$1 40	1 75	2 40

Hatfield's.

Per set $1 80 2 10 2 75 25

SHINGLES.

	Per Square
Zinc (Illinois)	$15 00

SHOES.

Milcor.

Galv. Std. gauge, Plain or corg. round flat crimp..65@
26 gauge round flat crimp..45%
24 gauge round flat crimp..15@

Square Corrugated.

Standard gauge 50%
26 gauge 35%

Conductor .....60@

SHOVELS AND SPADES.

Coal.

Hubbard's.

No.	A	B	C	D
1	$16 00	15 10	14 45	13 70
2	16 35	15 60	14 85	14 10
3	16 75	16 00	16 25	14 45
4	17 10	16 35	16 60	14 85

Post Drains & Ditching.

Hubbard's.

Size	A	B	C
14"	17 15	16 40	15 65
16"	17 50	16 75	16 00
18"	17 85	17 10	16 85
20"	18 20	17 45	16 70
22"	18 55	17 80	17 05

Alaska Steel.

D-Handle .....per doz. $3 50
Long Handle ..... " 3 00

SKATES.

Roller.

Ball Bearing—Boys' $1 50
Ball Bearing—Girls' 1 60

Ice.

Key Clamp Rocker, Men's and Boys' 0 70
Key Clamp Rocker, Men's and Boys' 1 03
Half Key Clamp Hockey, Women's and Girls'.... 0 96

SNAPS, HARNESS.

Covered Spring .....Add 30%
Judd's Pattern Add 33 1-6% to list

SNATHS.

Double Ring Bush..per doz. $9 75
Patent Loop, Bush.. " 10 00
Patent Loop, Grass. " 8 75

SNIPS, TINNERS'.

Clover Leaf .....40&10%
National .....40&10%
Star 50%
Milcor .....Net

SPRINGS, DOOR.

Perfect.

Nos.	2	3	4	5	6	7
Per doz.	45c	50c	55c	65c	80c	90c

Reliance.

	Light	Medium	Heavy
Per doz.	$1 80	2 40	3 75

Torrey's .....per doz. 1 65

SQUARES.

Steel and Iron.....Net
(Add for bluing, $3.00 per doz. net)
Mitre ..... "
Try ..... "
Try and Bevel..... "
Try and Miter..... "
Fox's .....per doz. $6 00
Winterbottom's 10%

STAPLES.

Blind.

Barbed .....per lb. 21@22c

Butter, Tub..... " 16@19c

Fence—

Polished .....per 100 lbs. $5 45
Galvanized ... " 6 15

Netting.

Galvanized ...per 100 lbs. 6 54

Wrought.

Wrought Staples, Hasps and Staples, Hasps, Hooks and Staples, and Hooks and Staples .....50&10%
Extra heavy 35%

STONES.

Axe.

Hindostan ....per lb. New Nets
More Grit .... " "
Washita ..... " "

Emery.

No. 126.....per doz. New Nets

Oil—Mounted.

Arkansas Hard
No. 7.....per doz. New Nets
Arkansas Soft " "
Washita No. 717 " "

Oil—Unmounted.

Arkansas Hard per lb. New Nets
Arkansas Soft " "
Lily White... " "
Queer Creek.. " "
Washita ..... " "

Scythe.

Black Diamond per gro. New Nets
Crescent .... " "
Green Mountain " "
LaMolle ..... " "
Extra Quinnebog ..... " "
Red End ..... " "

STOPS, BENCH.

No. 10 Morrill pattern .....per doz. $11 00
No. 11 Stearns pattern ..... " 10 00
No. 15 Smith pattern " 7 00

STOPPERS, FLUE.

Common .....per doz. $1 10
Gem, flat, No. 3... " 1 00
Gem, No. 1..... " 1 10

STRETCHERS.

Carpet.

Bullard's .....per doz. $2 90
Excelsior ..... " 5 25
Malleable Iron ... " 70
Perfection ..... " 6 30
King ..... " 4 50

Wire.

O. S. Elwood, No. 1 per doz. Nets
O. S. Elwood, No. 2 " "

SWIVELS.

Malleable Iron .....per lb. $0 16
Wrought Steel .....per gro. 4 50

TACKS.

Bill Posters' 6-oz. 25-lb. boxes per lb. 15c
Upholsterers' 6-oz., 25-lb. boxes, per lb.....15¼c

TAPES, MEASURING.

Asses' Skin .....List&40%

THERMOMETERS.

Tin Case .....per doz. 80c&$ 1 25
Wood Back... " $2 00& 12 00
Glass ..... " 12 00

TIES.

Bale.

Single Loop, carload lots .....75&7%
Single Loop, less than car lots .....70&15%

TRAPS.

Mouse and Rat.	Per gross
Sure Catch Mouse Traps..$	2 10
Vim Mouse Traps.....	2 10
Short Stop Mouse Traps.	1 80
Wood Choker Mouse Traps, 4 hole.....	10 25
	Per doz.
Sure Catch Rat Traps....$	0 90
Dead Easy Rat Traps....	80

Packed in One Bushel Band Stave Baskets.

	List per bushel
Sure Catch Mouse Traps (360 Traps) .....$	5 25
Short Stop Mouse Traps (360 Traps)	4 50
Sure Catch Rat Traps (54 Traps)	3 60
Short Stop Rat Traps (54 Traps)	3 15
Assorted Mouse and Rat Traps.	List per bushel
Sure Catch (216 Mouse Traps and 26 Rat Traps)$	4 90
Short Stop (216 Mouse Traps and 26 Rat Traps)	4 25

TROWELS.

Cement.

Atkins No. 6..... 19 50
" No. 9..... 25 50

TWINE.

White Cotton.

Eureka, 4-ply .....per lb. 30c

Jute.

3-ply and 6-ply Bale Lots 22½c

VALLEY.

Milcor .....
Galv. formed or roll.....60%

VISES.

No. 700, Hand, Inches	4½	5	5½
Doz.	$11 15	13 00	14 85

No. 701. In.	4	5	6
Doz.	$11 15	13 00	16 70

No. 1, Genuine Wentworth, Noiseless Saw....per doz. 9 25
No. 3, Genuine Wentworth, Noiseless Saw....per doz. 12 75
No. 500, All Steel Folding Saw .....per doz. 16 00

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AMERICAN ARTISAN
AND
HARDWARE RECORD
when writing to advertisers

WASHERS.

Cast.

Over ½ in. barrel lots, per 100 lbs.....$6 25

Iron and Steel.

In.	5/16	⅜	½	⅝	¾
	10¼c	9¼c	7⅝c	7½c	7 2/3c

WEATHER STRIPS.

Metallic Stitched.

½ in., per 100 ft.....$1 80
⅝ in., per 100 ft..... 2 20

Wood & Felt.

⅝ in., per 100 ft..... 1 56
⅜ in., per 100 ft..... 1 56

WEDGES.

	per doz. Nets
Ax.	
Galling .....per lb.	Nets
Saw .....per lb.	8½c

WEIGHTS.

Hitching .....per lb. Nets
Sash—f. o. b. Chicago
Smaller lots. per ton.... 50 00

WHEEL BARROWS.

Common Wood Tray.....$3 00
Steel Tray 4 50
Angle leg, garden..... 5 75

WHEELS.

Carborundum 50%
Emery 60%
Well, Ins..... 8 10 12
Per doz.....$5 50 7 25 8 50
12-in. heavy hoisting, per doz. $25 00

WIRE.

Plain annealed wire, No. 8 per 100 lbs.....$3 20
Galvanized barb wire, per 100 lbs. 4 10
Wire cloth — black painted, 12-mesh, per 100 sq. ft.... 1 90
Cattle Wire—galvanized catch weight spool, per 100 lbs. 4 10
Galvanized Hog wire, 80 rod spool, per spool..... 3 85
Galvanized plain wire, No. 3, per 100 lbs..... 3 70

WOOD FACES.

50% off list.

WRENCHES.

Coes Steel Handle, 6-in.....60%
" " " 8-in.....60%
" " " 10-in.....60%
" " " 12-in.....60%
Coes Knife-Handle, 6-in.....60%
" " " 8-in.....60%
" " " 10-in.....60%
" " " 12-in.....60%
Coes All Patterns.....60%

Knife Handle Pattern.

No. 63, Screw Wrench, List plus 30%
No. 60, Steel Handle.....30%

WRINGERS.

No. 790, Guarantee, per doz.		$49.50
No. 770, Bicycle ...	"	47 00
No. 670, Domestic .	"	43 50
No. 110, Brighton ..	"	39 00
No. 750, Guarantee.	"	51 00
No. 740, Bicycle ...	"	48 50
No. 22, Pioneer ...	"	35 50
No. 2, Superb ...	"	25 50

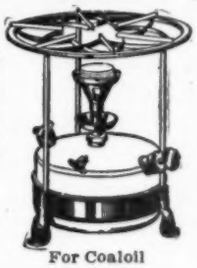
VESUVIUS

Blow Torches and Stoves

For Gasoline

have an extremely powerful flame. They are made of the best material that can be obtained and their construction insures long serviceability.

Write for Descriptive Circular Today



For Coaloil

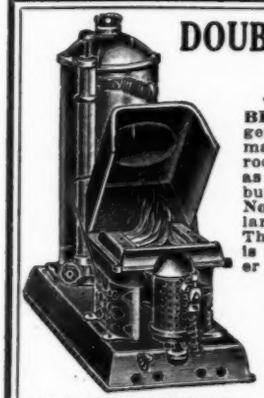
QUICK MEAL STOVE CO.

Div. American Stove Company

825 Chouteau Avenue St. Louis, Mo.

DOUBLE BLAST FIRE POTS

Gasoline Burning



No. 25 DOUBLE BLAST Tinners' Fire Pot

The **GENERATOR** used in **DOUBLE BLAST FIRE POTS** is the most powerful generator ever put on a fire pot. It is made of brass and will not rust or corrode. It has no packing of any kind, and as it has no small channels it cannot clog but will always burn a blue flame. Our **No. 25 Fire Pot** shown herewith has a large brass pump one inch in diameter. The tank is made of galvanized steel and is firmly fastened to the base. The burner on this fire pot is so arranged that the two hot blasts are forced from the outside to the center so that the iron in the fire receives both hot blasts. There are more features that you should know about.

Our latest catalog discribes our line in full. Write for it today.

DOUBLE BLAST MFG. CO.

NORTH CHICAGO, ILL.

Torrid

We want more Jobbing distributors of Torrid Tinners' Furnaces to supply the increasing demand. The price is fair and the profit attractive. The product is unsurpassed.

Write for our proposition.

GEO. W. DIENER MFG. CO., CHICAGO

No. 208 Torch
List Price, Each $17.00
Ask for Discount

BOTH NEEDLES ARE BLUNT CANNOT INJURE ORIFICE

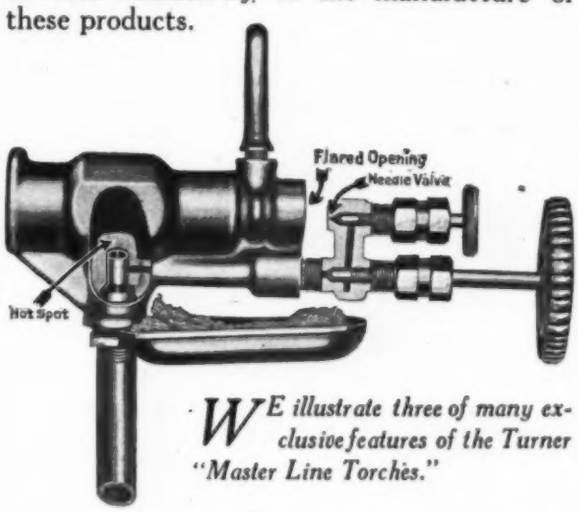
The No. 208 Double Needle Torch overcomes fully 60% of all Burner troubles, which are common to other makes having sharp pointed Needle. Impossible to force the gas orifice larger, thus insuring a perfect gas mixture and the highest degree of heat. Either gasoline or kerosene can be burned, giving reliable service indoors or outside in the wind or zero weather. Burner is cleaned by upper Needle, lower regulates flame. Jobbers supply at factory prices. Catalog mailed upon request.

CLAYTON & LAMBERT MFG. CO.

10635 Knodell Ave. DETROIT, MICH., U. S. A.

Torch Makers for 50 Years

FOR 50 years the Turner Brass Works have been makers of blow torches and furnaces. Ours is the largest plant in the United States devoted exclusively to the manufacture of these products.



WE illustrate three of many exclusive features of the Turner "Master Line Torches."

1. **"The Hot Spot Hump."** The obstruction in the burner tube that becomes white hot, instantly vaporizing kerosene or gasoline. This insures a hot, dry, clean, highly inflammable gas that gives complete combustion and a hot flame.

2. **Separate Needle Valve Control.** On all other torches, operators with more muscle than brain are almost sure to enlarge the orifice by strong arm work on the control wheel. This is impossible on the Turner, because the shut off and needle valves are separate. **Results:** Positive and delicate control of flame, from full blast to fine needle point, and an orifice always just right.

3. **Flared Air Inlet,** insures the maximum percentage of **air** in the mixture. This means hottest flame with least fuel. Additional oxygen is admitted in a long slot in the top of the Burner tube, which deflects the flame positively against the "Hot Spot Hump." Note there are NO HOLES in the burner tube, one reason why the Turner "Master" Torch won't blow out.

OTHER FEATURES:

Safety Valve and Air Release, making this the only SAFE torch on the market.

Pistol Grip Handle that won't tire the operator.

Lubricated Pump Leather.

Only ONE Opening in the Tank.

Send For Turner Bulletin

THE TURNER BRASS WORKS

Sycamore, Ill. U.S.A.

Oak Street

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Rice-Hitt Co., 417 Hibernian Bldg., Los Angeles, Calif.
Turner Brass Works, 36 Murray St., New York, N. Y.
A. H. Deveney & Co., 4th National Bank Bldg., Atlanta, Ga.

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Brakes—Cornice.
Dreis & Krump Mfg. Co., Chicago, Ill.
Maplewood Machinery Co., Chicago, Ill.

Brass and Copper.
American Brass Co., Waterbury, Conn.
Hussey & Co., C. G., Pittsburgh, Pa.
Copper & Brass Research Ass'n., New York, N. Y.

Builders' Hardware.
Bullard & Gormley, Chicago, Ill.

Cans—Garbage.
Osborn Co., The J. M. & L. A., Cleveland, Ohio

Castings—Malleable.
Fanner Mfg. Co., Cleveland, Ohio

Ceilings—Metal.
Burton Co., W. J., Detroit, Mich.
Friedley-Voshardt Co., Chicago, Ill.
Milwaukee Corrugating Co., Milwaukee, Wis.

Chain—Furnace.
American Chain Co., Bridgeport, Conn

Chain—Sash.
Parker Supply Co., New York, N. Y

Chaplets.
Fanner Mfg. Co., Cleveland, Ohio

Chisels.
Vaughan & Bushnell Mfg. Co., Chicago, Ill.

Clips—Damper.
Carr Supply Co., Chicago, Ill.
Waterloo Register Co., Waterloo, Iowa

Coal Chutes.
Majestic Co., Huntington, Ind.
Sykes Co., The, Chicago, Ill.

Cores—Auto Radiator.
Curfman Mfg. Co., F. L., Maryville, Mo.
G. & O. Mfg. Co., New Haven, Conn.
Zarco Mfg. Co., New York, N. Y.

Cornices.
Burton Co., W. J. Detroit, Mich.
Friedley-Voshardt Co., Chicago, Ill.
Milwaukee Corrugating Co., Milwaukee, Wis.

Cut-Offs—Rain Water.
Milwaukee Corrugating Co., Milwaukee, Wis.
Sullivan-Geiger Co., Indianapolis, Ind.

Dry Paste.
Carr Supply Co., Chicago, Ill.

Eaves Trough.
Abbott Mfg. Co., Cleveland, Ohio
Berger Bros. Co., Philadelphia, Pa.
Burton Co., The W. J. Detroit, Mich.
Clark-Smith Hardware Co., Peoria, Ill.
Lupton's Sons Co., David Philadelphia, Pa.
Milwaukee Corrugating Co., Milwaukee, Wis.
New Jersey Zinc Co., The, New York, N. Y.

Elbows and Shoes—Conductor.
American Rolling Mill Co., Middletown, Ohio
Dieckmann Co., Ferdinand, Cincinnati, Ohio
Lupton's Sons Co., David, Philadelphia, Pa.
Milwaukee Corrugating Co., Milwaukee, Wis.

Elevators—Hand and Power.
Kimball Bros. Co., Council Bluffs, Iowa

Enamel—Iron.
Black Silk Stove Polish Works, Sterling, Ill.

Enamel Ware.
Lalance & Grosjean Mfg. Co., Chicago, Ill.

Enamels—Wood.
Cornish & Co., J. B., Chicago, Ill.
Federal Varnish Co., Chicago, Ill.

Fence Gates.
American Steel & Wire Co., Chicago, Ill.

Fenders.
Meyers Mfg. Co., Fred J., Hamilton, Ohio

Files.
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Furnace Fan Corporation, Dowagiac, Mich.
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Milwaukee Corrugating Co., Milwaukee, Wis.

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Vaughan & Bushnell Mfg. Co. Chicago, Ill.

Handles—Boiler.
Berger Bros. Co., Philadelphia, Pa.

Handles—File.
Parker Supply Co., New York, N. Y.

Hangers—Eaves Trough.
Milwaukee Corrugating Co., Milwaukee, Wis.

Heaters—Combination Hot Water.
Melbye Bros. Co., Chicago, Ill.

Heaters—School Room.
Haynes-Langenberg Mfg. Co., St. Louis, Mo.
Meyer Furnace Co., Peoria, Ill.
Monroe Fdy. & Furnace Co., Monroe, Mich.
Standard Furnace & Supply Co., Omaha, Neb.

Heaters—Warm Air.
American Furnace Co., St. Louis, Mo.
Carr Supply Co., Chicago, Ill.
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Dunning Heating Supply Co., Milwaukee, Wis.
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Farquhar Furnace Co., The, Wilmington, Ohio
Farris Furnace Co., Springfield, Ill.
Forest City Fdy. & Mfg. Co., Cleveland, Ohio
Fox Furnace Co., Elyria, Ohio
Hall-Neal Furnace Co., Indianapolis, Ind.
Harder Furnace Co., A. P., Rockford, Ill.
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Independent Stove Co., Owosso, Mich.

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Kruse Co., Indianapolis, Ind.
Lamneck Co., W. E., Columbus, Ohio
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Whitney Metal Tool Co., Rockford, Ill.

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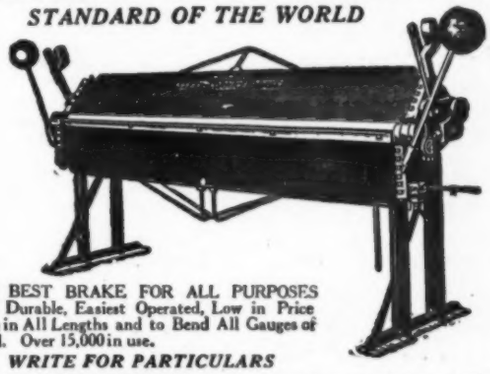

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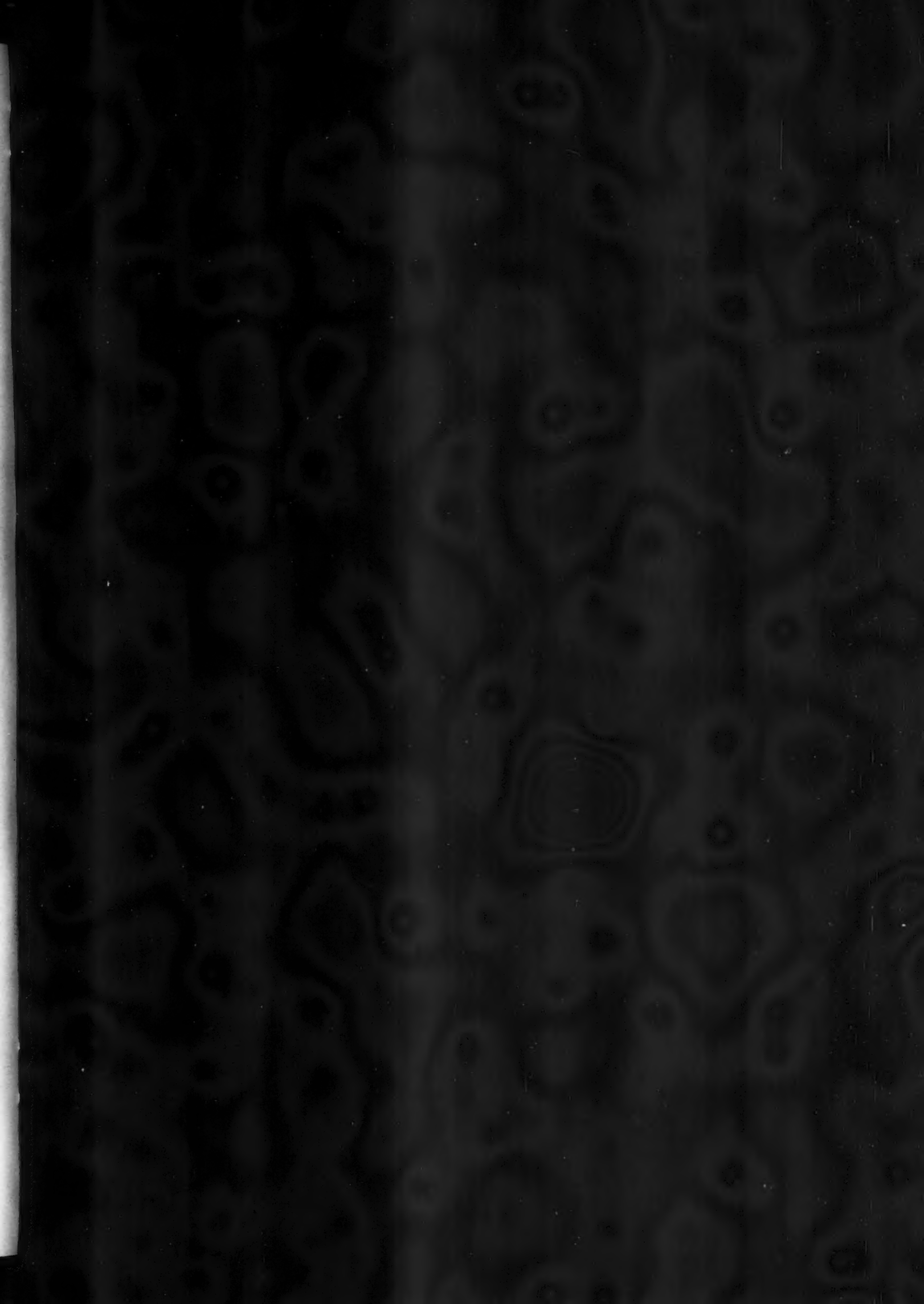

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CHICAGO, ILLINOIS

Real Selling Helps Free.
We will send you a large attractive four-color window display card, a four-color window transfer and also a supply of interesting booklets for distribution to people in your district. Ask us about them TODAY.

Haven't you had customers ask you for a good varnish?

AND did you have to tell them you didn't sell varnishes?

Most hardware stores carry a line of paints and varnishes and you can, too.

Ar-Ki-Teck Spar Varnish is the ideal brand of varnish for the hardware dealer because *the one grade is suitable for all purposes.*

It's the one high grade varnish you can sell your customers with assurance that it will give the utmost satisfaction no matter on what kind of job they use it.

If you will send us your name and address we will be glad to tell you in detail how you can sell Ar-Ki-Teck Spar Varnish **now** with good profits.

J. B. Cornish & Company
Northeast Corner State and Lake Streets
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WANTS AND SALES

For paid yearly subscribers, AMERICAN ARTISAN AND HARDWARE RECORD will insert under this head advertisements of not more than fifty words *WITHOUT CHARGE*. Employers wishing to secure employes, parties desiring to purchase or sell business, secure partners, or to exchange, etc., will find that these pages offer excellent opportunities to satisfy their wants. Clerks and tinsmiths looking for situations will find it to their advantage to use these columns. Those who respond to these announcements please mention that they "READ THE ADVERTISEMENT IN AMERICAN ARTISAN AND HARDWARE RECORD."

BUSINESS CHANCES

Lightning Rods—Sell our famous Copper Cable and Section Rods—endorsed and labeled by Underwriter's Laboratories. Special Patented One Piece Air Terminals —and many other exclusive features with Rock Bottom Prices. Don't do all the hard work and let your competitor put on the rods. Write today for agency. L. K. DIDDIE CO., Marshfield, Wis.

For Sale—Tin shop in town of 15,000. Paid for itself in eight months. Good reasons for selling. Address F-206 North Parkhill Street, West Frankfort, Illinois. 26-3t

For Sale—The only tin shop in town with all the work three men can do. Am doing $7,000 business. Am going in the furnace business and will sell cheap for quick sale. Box 142, Pleasant Lake, Indiana. 25-3t

For Sale—Radiator shop, Kansas oil town, a real opportunity for a good radiator man to make some good money. Good reason for selling. Address C. McEntarfer, 113 West 3rd Street, Eureka, Kansas. 25-3t

For Sale—Auto radiator shop, the only shop in twin Cities. Located in Center of Wisconsin. Doing good business, good reasons for selling. Write to Menasha Auto Radiator Shop, 290 Tayco Street, Menasha, Wisconsin. 25-ufn

Wanted to Buy—Small tinshop in central or northern Wisconsin, or set of tools and machines. State condition, price and list of equipment. No large shop or heavy stock. Address A-25, care of AMERICAN ARTISAN, 620 S. Michigan Ave., Chicago. 27-3t

Wanted—To buy, already established sheet metal business which offers chance for growth. Prosperous farming community in Central Illinois. Minnesota or Northwest preferred. What have you? State full particulars to A-23, care of AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago. 27-3t

For Sale—Plumbing, heating and sheet metal business in one of the best towns in northern Indiana. Established 25 years. Employs about ten men. Plenty of business at all times. Invoice about $8,000. Owner wishes to retire from business. Address A-26, care of AMERICAN ARTISAN, 620 S. Michigan Ave., Chicago. 27-3t

For Sale—Sheet metal and furnace business, this is a going concern, located in a city of 40,000 within fifty miles of Chicago. Have at present time $20,000 worth of unfinished work. Will require about $8,000 to swing deal. Good reason for selling. Address A-19, care of AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago, Illinois. 25-3t

BUSINESS CHANCES

For Sale—Stock of hardware $5,000. Store, building and residence under one roof, 2 story, price $6,000. Size of lot 40' by 300', building 26' by 70'. Electric light and hand power elevator, stove. Cash terms will be given on building. Please refer all communications to A-22, care of AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago. 27-3t

HELP WANTED

Wanted—One more all around sheet metal worker. Steady year around job, nine hours a day. Ranf Sheet Metal Works, Ludington, Michigan. 25-3t

Wanted—Tinner, one who can do inside and outside work and set up furnaces. For a good man will pay good wages and a steady job. Address C. A. Gorder, Waukesha, Wisconsin. 27-3t

Wanted—First class tinner and furnace man willing to help at plumbing and pump work. Steady work year around to the right man. Prefer married man. Give references and state wages. Sam Bergh, Wayland, Iowa. 27-3t

Wanted—Combination man for country shop. Want a man who is not afraid to give an honest day's work. Steady job to competent man. Pay every Saturday. State wages and salary in first letter. Address Box 156, Laurel, Nebraska. 27-3t

Wanted—Capable foreman, who can guarantee results, by a large roofing and sheet metal concern in Central Ohio. To a man of this caliber we will make it possible for him to become financially interested in our company. Write A-20, care of AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago. 27-3t

SITUATION WANTED

Situation Wanted — By tinner and hardware clerk, can do all work required in shop or outside. 15 years' experience, good references given. Address Tinner, 4146 Humboldt Avenue, North, Minneapolis, Minnesota. 25-3t

Situation Wanted—By first class sheet metal worker and furnace man. 27 years' experience, prefer a small town between 1,200 and 5,000 inhabitants. Married and want a steady job. Please state wages, etc., in first letter. Address Tinner, 351 Merino Street, Lexington, Kentucky. 27-3t

Situation Wanted—By an A-1 tinner, plumber and steamfitter with 15 years' experience. Had my own shop for 7 years. Can lay out and figure my own work. Address A-24, care of AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago. 27-3t

Situation Wanted—By expert radiator man with 10 years' experience. Capable of managing shop, attending to all details. Expert on recore work and freeze-ups both tubular and honey-combs. Have also general sheet metal experience. Address A-21, care of AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago. 27-3t

TINNERS' TOOLS

Wanted — One 8-foot second-hand brake and other tinners' tools. Send list and prices. Feslers' Tin Shop, Palestine, Texas. 26-3t

Wanted—In good condition, two large second hand turning machines, also 36" Squaring Shears. State make and price to G. T. Mueller and Son, Columbus, Wisconsin. 25-3t

Wanted—To buy a good circular shear, must be in good shape. Name make and price. Also a set of Hollow punches. Acme Sheet Metal & Radiator Shop, Parkston, South Dakota. 25-3t

For Sale or Trade—A good setting or pinning down machine. $10 cash buys it. Or will trade it for a used set of Hollow Punches or a 20 inch Bar folder. Acme Sheet Metal and Radiator Shop, Parkston, South Dakota. 25-3t

SPECIAL NOTICES

Special Notices — displayed want ads — are charged at the rate of $3.00 per inch per insertion.

PATENTS
HUBERT E. PECK
Patent Attorney
Pacific Building, WASHINGTON, D. C

SALESMEN WANTED

Southern Iowa and Northern Missouri territory by large Sheet Metal Manufacturer making a complete line of building products. Give age, experience, and salary wanted to start. Replies will be held confidential. Address D-78, care of AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago. 27-2t

SALESMAN

Have attractive proposition for live, wideawake salesmen living in Chicago. Must have neat appearance and be willing to work hard. Our device—Furnace Fan—revolutionizes warm air heating. Big advertising campaign—live leads. Call or write F. E. Tarrant & Son, 15 East Van Buren Street, Chicago, Illinois. 26-2t

OHIO SALESMAN WANTED

Only live man need apply. Premier Warm Air Heater Company, Dowagiac, Michigan. 25-2t

EXPERIENCED

Warm Air Furnace Salesmen

WANTED

To represent a popular line of cast furnaces, Pipe and Pipeless, in the states of Ohio, Indiana, Wisconsin, Kentucky and Tennessee. Commission basis. Permission granted to carry allied line. References required. Address D-70, care of AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago. 25-2t

SPECIAL NOTICES

HUSTLING FURNACE

And Boiler salesman of 10 years' experience looking for change which will lead to permanent executive future. Knows furnace game thoroughly—lay-out and installation as well as sales; and has always produced the goods. Well acquainted with trade in Chicago and Northwestern Indiana. Address D-68 care of AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago. 24-2t

WANTED to BUY

An established hardware store in Chicago. Must be a good stand. Can pay cash. Address D-76, care of AMERICAN ARTISAN, 620 South Michigan Ave., Chicago. 25-2t

LIVE WIRE FURNACE SALESMAN

whose previous record shows he can produce the business is now open for engagement. Address D-62 care of AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago. 21-2t

WANTED TEN SALESMEN

Only experienced furnace men need apply. Rudy Furnace Company, Dowagiac, Michigan. 24-2t

SPECIAL NOTICES

We want a good live wire furnace and furnace supply SALESMAN

for

ILLINOIS and WISCONSIN

HERE is a real profitable connection for the man who wants to produce. We are a well known house doing a big business in this territory. We handle a good sound line that is going big now without a man on the road. Get in touch with us at once.

CARR SUPPLY COMPANY

414 No. Dearborn St. CHICAGO, ILLINOIS

ATTENTION

To stove and furnace Manufacturers. Would like to represent a good Stove and Furnace Manufacturer in Wisconsin. Can lay out Warm Air Furnace work and install same. Can give references. Address D-75, care of AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago. 27-2t

No. 3 Electric

Kimball ELEVATORS AND DUMB WAITERS

Hand Power | Passenger
Electric | Freight

KIMBALL BROS. CO.

"Change Your Hand Power to Electric"

COUNCIL BLUFFS, IA.
1110 9th Street

FOR SALE

Furnace Patent. Have patented a sheet metal odorless heat radiator 100% efficient and suitable for any kind or size of coal, oil or gas burning furnace, pipe or pipeless, floor furnace and gas unit heater systems. Address Lundin, 1205 North La Salle Street, Chicago, Ill. 27-1t

ZARCO

TUBULAR, SECTIONAL Radiator-Core

Best and most Practical for Replacement. Shops keep 10-foot sections on hand and assemble cores for **Any Radiator** on spot. **The Only** core of its kind. **All Shapes.** Costs 1 cent per cubic inch not assembled, and 1¼ cent assembled, complete.

Order from Zarco Mfg. Co., Inc.,
407-13 E. 91st St., New York
or Zarco Assembling Station,
2614 So. Clifton Park Ave., Chicago, Ill.

WANTED by JANUARY 1st

Foreman in steel furnace factory to take full charge of steel department. This includes laying out. If you can qualify answer quick. Address D-77 care of AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago, Ill. 26-2t

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"The Genuine"

A good seller at all times.

Write today for complete catalog

FRED J. MEYERS MFG. CO.
HAMILTON, OHIO

The "CENTENNIAL" Rain-Water Cut-Off

The strongest, most durable and cheapest CUT-OFF on the market.

The only single cut-off made to fit Corrugated and plain pipe and which can be used without extra pipe or elbows.

FOR SALE BY ALL LEADING JOBBERS

Manufactured only by

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501-509 Madison Ave., INDIANAPOLIS, IND.

SHEET METAL WORKERS—ATTENTION!

Automobile Radiator Repairing is at last being done by the men who rightfully should get this business. Have you as yet started to take care of the ***automobile radiator repairing*** in your town or city? The business of ***repairing automobile radiators*** is one of the best paying branches in the sheet metal line. **FALSE FINS,** as shown in the accompanying illustration,

are the chief supplies needed for the most successful repairing of automobile radiators. We are the manufacturers o. them and other supplies and tools needed for this work. Don't let the automobile radiator business get away from you. Write ***today*** for full information.

We are the originators of Automobile Radiator Repairing tools and supplies. Service is our motto. The people you repair radiators for will demand service from you and we want you to demand the same from us; we are used to it. ***Write for our catalog today.***

F. L. CURFMAN MANUFACTURING CO.

MARYVILLE, MISSOURI

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WIRE

electrical, rope, airplane, piano, pipeorgan, flat wire (strip steel) hoops, bale-ties, tacks, nails, barbed-wire, concrete reinforcement, springs, netting, wire fences, steel posts, steel gates, trolley wire and rail bonds, wire wheels, auto-towing cables, horse shoes, round and odd-shape wires for manufacturing, screw-stock. **Illustrated books describing uses, FREE**

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Any Hardware Store

can always use new ideas to help increase its sales.

Be sure to read the pages of AMERICAN ARTISAN AND HARDWARE RECORD ***every week*** — you will secure ideas which ***you*** can use to help increase the sales of ***your*** hardware store.

No Argument Necessary

ADVERTISING NOVELTIES do the work. They bridge that gap between you and the buying public. Try it and increase your business, not for today but for a long time to come.

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Are made from Tight-Coat Galvanized Open Hearth Sheets and the workmanship is of the best. All sizes.

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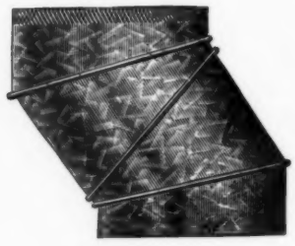

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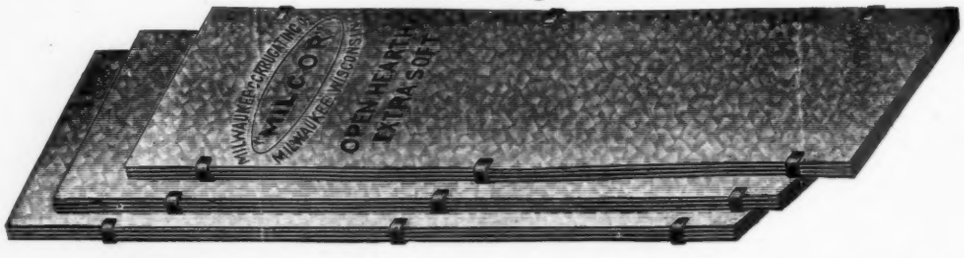

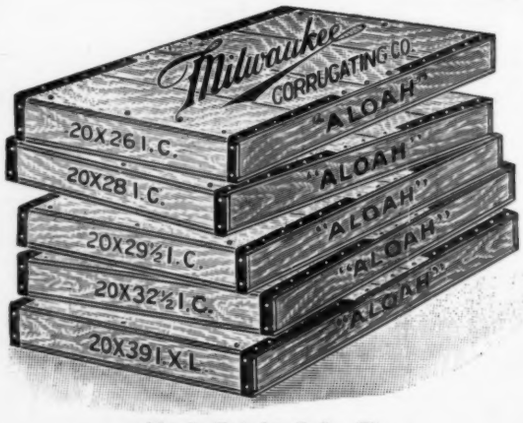

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Furnace men and Sheet Metal Contractors will find our Galvanized Sheets and Coke Tin the best obtainable, and prompt shipments are guaranteed. Prices quoted on application.

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